

September 2004

ASSESSMENT AND DEVELOPMENT OF MUNICIPAL WATER AND WASTEWATER TARIFFS AND EFFLUENT CHARGES IN THE DANUBE RIVER BASIN.

Volume 2: Country-Specific Issues and Proposed Tariff and Charge Reforms: Slovak Republic – National Profile



WORKING FOR THE DANUBE AND ITS PEOPLE



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PREFACE

The Danube Regional Project (DRP) consists of several components and numerous activities, one of which was "Assessment and Development of Municipal Water and Wastewater Tariffs and Effluent Charges in the Danube River Basin" (A grouping of activities 1.6 and 1.7 of Project Component 1). This work often took the shorthand name "Tariffs and Effluent Charges Project" and Phase I of this work was undertaken by a team of country, regional, and international consultants. Phase I of the UNDP/GEF DRP ended in mid-2004 and many of the results of Phase I the Tariffs and Effluent Charges Project are reported in two volumes.

Volume 1 is entitled *An Overview of Tariff and Effluent Charge Reform Issues and Proposals*. Volume 1 builds on all other project outputs. It reviews the methodology and tools developed and applied by the Project team; introduces some of the economic theory and international experience germane to design and performance of tariffs and charges; describes general conditions, tariff regimes, and effluent charges currently applicable to municipal water and wastewater systems in the region; and describes and develops in a structured way a initial series of tariff, effluent charge and related institutional reform proposals.

Volume 2 is entitled *Country-Specific Issues and Proposed Tariff and Charge Reforms*. It consists of country reports for each of the seven countries examined most extensively by our project. Each country report, in turn, consists of three documents: a case study, a national profile, and a brief introduction and summary document. The principle author(s) of the seven country reports were the country consultants of the Project Team.

The authors of the Volume 2 components prepared these documents in 2003 and early 2004. The documents are as up to date as the authors could make them, usually including some discussion of anticipated changes or legislation under development. Still, the reader should be advised that an extended review process may have meant that new data are now available and some of the institutional detail pertaining to a specific country or case study community may now be out of date.

All documents in electronic version – Volume 1 and Volume 2 - may be read or printed from the DRP web site (<u>www.undp-drp.org</u>), from the page <u>Activities /</u> <u>Policies / Tariffs and Charges / Final Reports Phase 1</u>.



We want to thank the authors of these country-specific documents for their professional care and personal devotion to the Tariffs and Effluent Charges Project. It has been a pleasure to work with, and learn from, them throughout the course of the Project.

One purpose of the Tariffs and Effluent Charges Project was to promote a structured discussion that would encourage further consideration, testing, and adoption of various tariff and effluent charge reform proposals. As leaders and coordinators of the Project, the interested reader is welcome to contact either of us with questions or suggestions regarding the discussion and proposals included in either volume of the Project reports. We will forward questions or issues better addressed by the authors of these country-specific documents directly to them.

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Abbreviations

BOD	Biological oxygen demand
HH	Households
ICPDR	International Commission for the Protection of the Danube River
MoE	Ministry of Environment
MU	Management unit
NRO	National Office for Regulation of Network Sectors
SEF	Slovak Environmental Fund
SWME	Slovak Water Management Enterprise
VAT	Value added tax
W&WW services	Water and wastewater services
WFD	Water Framework Directive
WW utility	Water Works utility
WWTP	Wastewater treatment plant

1 Introduction

This report is, first of all, a compilation of information and data that describing the institutions and conditions that shape and characterize the provision of municipal water and wastewater service in Slovakia. The purpose of this compilation is to provide background and inspiration for proposals to reform both the current system of water and wastewater tariffs and effluent charges and coincident proposals to adjust or modify the legal and regulatory system within which these tariffs and effluent charges function in Slovakia. Indeed, some chapters include brief analyses suggesting such reforms and Chapter 9 concludes this report with preliminary proposals for reforms in the institutional setting and design of these tariffs and charges. The aim of these proposals is to improve the management of water and wastewater resources used in the municipalities of Slovakia generally and, including protection of water resources from nutrient loading and toxic substance originating from municipal systems.

1.1 Overview

The territory of Slovakia covers 49,034 km². The country is divided into 8 regions and 79 districts. Within this broader administrative division there are 2,883 municipalities. Slovakia has a population of around 5.4 million and a population density 109.9 inhabitants per km². Slovakia is a rural country of small settlements, the urban population is 56% concentrated in a few larger cities.

Slovakia is a country in economic transition. In 2000 the GDP reached 887.2 bill. SK (constant prices). The average unemployment rate in 2002 was 19.6%. The rate of inflation increased dramatically in 1999, when large portion of the price reform of public services was introduced (including water services). In May 2004, Slovakia became a member of the EU.

1.2 Overview of the Origins and Status of the Municipal Water and Wastewater Industry

Management of water resources did not undertake any economic restructuring the political changes after 1989. The Government has had the responsibility to regulate, develop, and provide water services to all users, such as households, industry and agriculture. However, several administrative changes impacted also the economic development of water infrastructure and water and wastewater (W&WW) services provisions.

With respect to infrastructure development, the W&WW services were funded directly by the Government (through the Ministry of Forest and Water Management). These services were provided for both inhabitants and industry (industrial activities were also in state hands).

Water industry was not privatized and W&WW services were still provided by the state-own water works (WW) utilities, even though the Act on Municipalities (from 1990) delegated the public services (among W&WW services) to municipalities. The economic recession brought several problems in water infrastructure development:

- Changes in management, investment policies, and house-keeping performance of other industrial sectors were not the case in the water industry as this sector did not experience any restructuring
- State contributions to investment in W&WW systems decreased (stopped) and state budgetary assistance was directed toward the recovery of operating costs
- Accounts receivable of water operators both direct and secondary debts increased
- Metering of households brought decreases in water consumption and W&WW utilities were not prepared to for the consequent loss in revenues.

1.3 Future Directions

In 1997 the Government decided on the decentralization of W&WW services and a transfer of assets to the municipal level. Unfortunately, the process was politically hampered and several times postponed. The final decision on the decentralization was taken in 2003. The year 2003 is a critical year and it is important for the reader of this report to realize following issues:

- the Act on Water Supply and Sewerage Utilities was adopted in 2002 and implementation began in 2003
- the Water Act was adopted in 2003, will be implemented from 2003 and there is a plan to amend the Water Act in 2004 (to meet the compliance with the EU Water Framework Directive)
- decentralization (transfer of state owned W&WW utilities to municipal water companies) will be completed by the end of 2003 and the municipal water companies will be allowed to enter public – private partnerships
- decentralization with former state administration responsibilities (also in other sectors, such as education, health care, urban planning, waste management) being transferred into municipal level and the decentralization will be completed by 2004 (public policy reform)
- during 2003, all valid water discharge permits are being revised by environmental authorities and new permits (taking into account stricter pollution limits) are being issued
- the Government adopted the Regulation on Provisions of Water Services and it was implemented in 2003. Before this period, the water prices for households were limited by the resolution (decision) of the Ministry of Finance and prices for other clients were individually negotiated between operators and clients. From 2003, the prices for households are regulated based upon the justified economic costs of service provisions. The National Office for Regulation of Network Services has the decision making power to decide on the maximum allowable price both for households and other clients. The National Office annually issues decisions about the maximum prices and tariffs to each individual supplier of W&WW services.
- based upon the Directive Specific Implementation Plan to meet the EU requirements (MoE, 2001), the Government has committed to develop an investment strategy to construct the water infrastructure. As a part of the strategy, the financial plan to absorb EU funds and to prioritize investment projects is supposed to be outlined. The strategy is to be finalized by 2004.

2 Legal and Institutional Setting

2.1 National Laws and Regulations Governing Provision of Municipal Water and Wastewater Service

2.1.1 Common Provision

Main water services related legislation is as follows:

Water Act 184/2003 was adopted recently and transposed the EU water-related legislation (except of several provisions of WFD). According to the Water Act, each agglomeration larger that 2000 person-equivalent (pe) should be connected to a sewerage system and wastewater should be treated prior to discharge to the recipient water body. For agglomerations larger than 10 000 pe, adequate treatment that removes nutrients should be provided. The Water Act defines the time schedule to meet the obligation to construct sewage systems with the adequate treatment. That is the year 2010 for large agglomerations (more than 10 000 pe) and 2015 for small agglomerations (from 2 000 – 10 000 pe)1.

According to Water Act, each withdrawal of water and each discharge of wastewater are subject of permit. There is a Regulation 491/2002 on permissible levels of pollution discharges and ambient quality standards of receiving waters.

Also, according to the 2003 Water Act, every discharge of wastewater into the recipient is subject to an effluent charge. The details are provided in the Regulation 35/1979 on Pollution Charges. This regulation was adopted in 1979 (with a small amendment in 1989) thus does not address neither incentive nor revenue raising functions of pollution charge. In general, the pollution charge depends on the quantity and quality of discharged wastewater. Five polluting substances are currently subject of payment (BOD5, insoluble substances, crude oil substances, acidity or alkalinity, dissolved inorganic salts). Water experts now discuss a proposal of a new effluent charge regulation, no consensus was found yet.

- Act 442/2002 on Water Supply and Sewerage Utilities establishes basic conditions for organization and provision of service. The Act regulates the establishment, development and operation of public water works. According to the Act, the owner and operator could be any physical or legal person that receives a license to own or operate the system. Services are provided by operators and revenues from these services go directly to operator or owner of facility. The maximum permissible tariff for W&WW service is set by the National Office for Regulation of Network Sectors and applies nationwide.
- Act 514/2001 on Human Health Care that sets hygienic requirements for the drinking water supply. The Act also provides for the inspection of drinking water operators with respect to meeting the hygienic limits of drinking water provided to inhabitants.

¹ Although the Water Act refers to "agglomeration" as requested and defined by the EU directive, further in the paragraphs, the obligation to connect inhabitants to sewerage and WWT systems is given to the "administration unit" - municipality. This might have "investment constraint" consequences because it could happen that few or several municipalities smaller than 2 000 pe will not be on "priority list" for the infrastructure development even thought they do not fit into the

[&]quot;agglomeration" classification of the EU. Currently, there is a research project conducted by the Water Research Institute that should consolidate "appropriate agglomerations" that would support the investment decisions with respect to the construction of water infrastructure. Unfortunately, the research is in delay to prepare Slovakia for decent investment projects for EU structural funds.

2.1.1.1 Service Area

Service area is defined primarily by five W&WW utilities that administer W&WW services to inhabitants and industries. These five large units were (till 2003) subdivided into smaller "odstepne zavody" that were typically connected to district town as follows:

- Bratislava W&WW utility
- West Slovakian W&WW utility and its 11 small units (Bratislava-vidiek, Dunajska Streda, Galanta, Komarno, Levice, Nitra, Nove Zamky, Senica, Topolcany, Trencin, Trnava)
- North Slovakian W&WW utilities and its 7 small units (Cadca, Dolny Kubin, Liptovsky Mikulas, Martin, Povazska Bystrica, Zilina, Ruzomberok)
- Middle Slovakian W&WW utilities and its 7 small units (Banska Bystrica, Lucenec, Prievidza, Rimavska Sobota, Velky Krtis, Zvolen, Ziar nad Hronom)
- East Slovakian W&WW utilities and its 12 small units (Bardejov, Humenne, Kosice, Poprad, Presov, Revuca, Spisska Nova Ves, Stara Lubovna, Svidnik, Trebisov, Vranov nad Toplou).

In addition to state-owned W&WW utilities, some municipalities individually built and operated so called "municipal water systems". The legal basis for the establishment of municipal water system is given in the Act on Municipalities (of 1990).

Service areas are in general defined by

- the size of state owned W&WW utilities that coped, in general, with the borders of administrative districts, and
- limits of municipalities that established own W&WW systems.

Service areas have grown for several reasons, among which the availability of financial resources was the most important.

2.1.1.2 Conditions of Service

Conditions of services provided by operators are specified and defined in the Act on Water Supply and Sewerage Utilities. The customers should be served 24 hours a day with water quality that meets required hygienic standards. Customers must pay the invoice for the water received and wastewater discharged by/into the operator's facility.

2.1.1.3 Reporting Requirements

W&WW utilities operators are obliged to submit several reports that involve:

- cash flow
- annual reports on services provided
- annual reports on general operation and performance of the facility(ies)
- annual environmental report that include emissions and quantity of discharged wastewater, amount of withdrawn water
- annual report on pollution charges to be paid (based upon both the decision and the actual discharge).

These reports are submitted to responsible authorities and are accessible to the public. Aggregated statistical data are published by National Statistical Office (on scale of services provided), by the Ministry of Soil Management (on operation, subsidies, revenue and expenditures), and by the Ministry of Environment (on emissions).

2.1.1.4 Ownership of infrastructure

According to the Act on Water Supply and Sewerage Utilities, the owner and operator could be any physical or legal person that receives a license to own or operate the system. As the result of the transformation of water service provisions, municipalities are obliged to establish Municipal water companies (as successor companies of old W&WW utilities) where the involvement of private sector is not regulated. Currently, in Slovakia, there are municipal water companies that either provide services as public entities or contract public/private entities for limited period (from 10-25 years).

2.1.2 Self Service

Households that are not connected to the public water infrastructure use water from individual wells. These wells are equipped with single pumps and the quality of water is not monitored. The share of inhabitants supplied by water from individual wells is 15%. The individual withdrawal is not regulated. Households' self-service in the case of wastewater disposal is significant, representing 45%. The wastewater is disposed in individual septic tanks. Households using individual holder tanks are subject of random inspection with respect to regular emptying of septic tanks.

In order to make picture complete, the self-service user might be also an industry. Industry that withdraws water for industrial processes from own sources and discharge wastewater after the treatment at own WWTPs. Each user of water (more than 10 l/min or 4 800 m³/year or 400m³/month) and dischargers into the recipient must have a permit. Besides receiving a permit, self-serving entities must pay withdrawal charges and effluent charges.

2.2 Management Units

2.2.1 Administrative Units

Basic administration units are municipalities. According to the Act on Municipalities (1990), municipalities are responsible for the supplying their inhabitants with drinking water and provision of sewerage and treatment services. There are 2883 municipalities with the status of "town" or "village"².

2.2.2 **Operating Units**

In the past, the W&WW services were the responsibility of state-owned water and wastewater (W&WW utilities). These are still the operating units but a decentralization process is in progress and should have been completed by the end of 2003.

The state ownership means that planning, development, monitoring and budgeting was done by the Ministry of Soil Management. There were 5 W&WW utilities subdivided into "odsepne zavody - OZ" (daughter or smaller units without budgetary, development and planning autonomy) (totally 47). Sizes of OZ varied and usually were attached to a specific town or service area (see 2.2.1). The operation unit thus involved a physically integral unit of drinking water supply and distribution and collecting wastewater and treatment.

The revised system of operating units is not finalized, as the decentralization of 5 W&WW utilities is not completed yet. According to the Resolution of the Government (in June 2001), no more than 7 (!)

² Villages are small units with the simple administrative and economic activities and towns are larger units usually providing public services to several surrounding villages.

municipal joint stock water management companies can be created. There is an exception to this rule, as 4 water companies were established prior to the final decision on decentralization. These "grandfathered" exceptions are:

- The City of Trencin. The owner of the W&WW infrastructure is a company wholly owned by the City. The company that has a contract to operate the system is owned by a private investor Suez Lyonnaise des Eaux-ONDEO (50.1%), and several municipalities (49.9%). The operating company was established in 1998 and was granted by a 20-year contract by the municipality.
- The City of Ruzomberok. In 1999 a concession to provide W&WW services was granted to the Slovak Cellulose & Paper Company. This occurred because the company was willing to accept municipal wastewaters to be treated in its facilities.
- The City of Komarno. In 1997 the City established a wholly city-owned and city-operated municipal water company KOMVaK, a.s.
- The City of Hlohovec. In 1998 the Hlohovec city established a municipal joint stock company Dubovany Water and Sewage Company, s.r.o.

The process of decentralization is as follows:

- Property formally owned by the W&WW utilities is presently under the supervision of the National Property Fund
- Municipalities enter into negotiations with each other and W&WW utilities to establish municipal water companies³
- National Property Fund transfers assets and obligations to these newly created municipal water companies
- Once the property is transferred into the municipal water companies, these water companies can, in principle, form joint ventures with private companies or sell the assets to them. The later possibility was not tested yet.

By September 2003, following W&WW utilities have been cancelled (terminated) and new municipal water companies have been established:

- Bratislava (former Bratislava W&WW utility)
- Nitra Water Company (former West-Slovakian W&WW utility)
- Trnava Water Company (former West-Slovakian W&WW utility)
- East-Slovakian Water Company (former East-Slovakian W&WW utility)
- Podtatranska Water Company (former East-Slovakian W&WW utility)
- Middle-Slovakian Water Company (former Middle-Slovakian W&WW utility)
- North-Slovakian Water Company (former North-Slovakian W&WW utility).

In addition to the large W&WW utilities and the larger municipal systems described above, some municipalities constructed (so they are owners) and they operate W&WW services facilities. They began de-facto operation after 1989, when a cut in the central government budget for water and wastewater investments created a financial and service crisis situation. In 2001 such towns and

³ According to the Resolution of the Ministry of Soil Management, these companies must be publicly owned and ownership shares are divided according to the population size of each municipality regardless of the scope (extent) of w&ww services currently provided.

villages served 4.8% of Slovak inhabitants served by a central water supply and 3.2% of Slovak inhabitant served by a central sewage collection and treatment systems.⁴

2.3 Service Users

In general, the following classes of water users are distinguished:

- households
- large industrial plants
- small industrial plants
- commercial and institutional bodies.

The classification of users (consumers) is based on

- the magnitude of water consumption and wastewater production,
- the type of wastewater pollution discharged to public sewer system and pretreatment (if any) used.

W&WW operators have separate contracts with each user connected to public water supply and sewer system. The quality and quantity of wastewater discharged to public sewer system is regularly monitored by W&WW operator and by user with frequency related to wastewater flow rate and level of wastewater pollution discharged.

The consent contract between user and operator usually sets the following limit values:

- withdrawal in m³/year
- discharge in m³/year,
- concentration average for particular pollution parameters in mg/l,
- maximum concentration and total mass limit in t/year.

This division is made also due to the different tariff rates of services. There are different tariff rates for "Households" and for "Others Users" (industries, and commercial and institutional units). This division is important because different ways of establishing and regulating tariff rates for W&WW services apply to these two classes of water users. Household consumers are inhabitants, but also, this group includes some "Other" entities that provide public services, such as kindergartens, schools, hospitals, social and reeducation centers.

2.4 Regulatory Units

2.4.1 Environmental Regulation

The Ministry of Environment is the responsible for the setting and enforcement of water-related and other environmental regulations. It also coordinates the activities of its water related institutions, such

⁴ It is not clear if these municipal water utilities have to enter into newly established municipal water companies because they are located in newly designed service areas. Positions differ; those municipalities that developed the facilities purely from own sources, work in "profit", and do not have technical problems in operation of w&ww services are reluctant to hand over (surrender) their assets into a large units with few shares.

as Slovak Hydro-meteorological Institute (and from July 2003 also the Water Research Institute). The MoE supervises 8 Regional and 79 District offices responsible for the issuing permits to withdraw and pollute waters. These offices also give a permit for construction of facilities (such as water networks, sewer systems, pumping stations, water treatment and wastewater treatment plants)⁵. There are 5 local water inspectorates that report to the MoE. These inspectorates have the power to impose fines for violation of environmental legislation and regulations.

The Ministry of Health Care is the responsible for setting and enforcing hygienic limits of drinking water. The same pollutants as required by the EU Drinking Water Directive are regulated, with the main division to obligatory and recommended parameters. Through its 37 hygienic institutes (so called State Health Institutes), monitoring and compliance with the hygienic limits of drinking water is conducted⁶. Each drinking water operator has an obligation to regularly report on the production and quality of drinking water that is provided to the water system⁷. The Act on Health Care was amended in 2001 to require that drinking water quality be measured at the point of consumption, as required by the EU.

2.4.2 Economic Regulation

Formerly (till 2002), economic regulation was conducted by the Ministry of Finance that:

- regulated tariffs of W&WW services for Households. Rates were gradually increased from 1990 but still do not cover the full operating costs of operators⁸. It is necessary to mention, that tariffs for Others were not regulated and were individually negotiated between provider and client.
- provided budgets for the state-owned entities (those under the central government, such as W&WW utilities, SWME, Water construction company); municipalities are excluded as they receive annual budget based upon the size and number of population that includes an "infrastructure development budget". The state budget allocation in recent years gradually decreased.
- provided non-investment subsidies to recover the costs of W&WW service providers. The state subsidies gradually decreased and stopped in 2001.

From 2003 the National Office for Regulation of Network Sectors (Act 276/2001) was established to monitor and regulate water tariffs based upon the "justified" costs of each individual operator. Each provider of W&WW services must apply for the permit to charge "inhabitants and other" clients in a given year and the National Office issues a decision (that is publicly available) for each individual provider.

According to Act on Water and Sewerage System, anybody could provide W&WW services. Thus, the National Office regulates

- Maximum tariffs for Households and Other Users provided by large municipal operators
- Maximum tariffs for Households and Other Users provided by small municipal operators
- Maximum tariffs for Households and Other Users provided by any W&WW service operators

The maximum tariff for Households is defined as the maximum tariffs in the previous year multiplied by the coefficient 1.35 for drinking water and 1.30 for wastewater. This maximum tariff cannot be exceeded regardless of the production costs of the supplier. Above-mentioned coefficients will be

⁵ It should be noted, that District and Regional offices (so called "general state administration") are established and budgeted by the Ministry of Interior. The Ministry of the Environment has a "supervision" role of the environmental departments of regional and district offices but has limited power to manage and control daily task assignments and their execution.

⁶ Due to financial constraints, the regular monitoring of hygienic limits is done randomly or is targeted based on cases arousing suspicion, recent non-compliance or epidemic situations. Institutes also monitors bathing waters.

⁷ Reports are not available for the public due to several "technical" problems of processing and interpreting of data received.

⁸ The level of rates was constant until 1990 (the price of drinking water was 1.74 SK/m³ and price of sewage water was 1.31 SK/m³). In 2002, the price of drinking water was 11,50 Sk/m³ and price of sewage water was 7,50 SK/m³.

applied until the maximum tariffs of "Households" and "Other Users" are equal. There is a plan to reach the same tariff for both groups of consumers by 2005.

The National Office also classifies the "Others" grouped with "Households" to whom the maximum tariff is being charged; these are for example diagnostic centers, orphans, student hostels and dormitories, old people's homes. These "similar-to-household" consumers are specified in the decision for each individual supplier.

The National Office directly regulates maximum tariff for "Other Users". The steps are as follows:

- Average tariff of an operator is calculated based upon a complex formula. This formula includes "economically justified cost" (production cost) of operators, cost-plus-contract "profit" and correction coefficient of discount rate. There is a detailed list of those items that are eligible and non-eligible to be included into economically justified costs.
- The total cost of operator minus income from "Households and Others" (regulated prices) will create the tariff for "Other User" clients.

Basic rule is that the tariffs are designed to cover the operation costs of W&WW operator but discriminates against "Other Users" in favor of "Households and Other" consumers. Peculiar situation is when the operator has a high share of households where the maximum tariff is given (previous-year-price multiplied by 1.35 or 1.30) and the rest of the production cost must be reallocated among other clients (big cake of cost is divided among "Households and Others" and "Other Users" artificially and is based upon a "social affordability" of Households). It is not clear, what the basis for the maximum tariff was in the past. The coefficients are also "arithmetically" design to meet the same price of both groups in 2005.

3 Production Quantity and Quality

3.1 Water Production, Distribution and Consumption

Water for drinking water purposes is produced mainly from ground water sources (more than 83%). The production of water in m³ and its trend is shown at the Table 1. The ratio between produced and invoiced water represents water losses (28.5%) and technological water (2.3%) (data of year 2001).

Table 1Drinking Water Production, Sales, Losses, and Household Consumption in 1999-
2001

Parameter	Unit	1999	2000	2001
Water produced, of which	mill m ³	402.5	391.7	367.2
from ground water sources	mill. m ³	336.0	323.6	304.2
Water invoiced, of which	mill.m ³	286.5	275.1	260.5
for households	mill.m ³	185.9	181.6	172.2
Losses and unaccounted water, of which	mill.m ³	116.3	117.0	107.2
Losses in pipelines	mill.m ³	96.8	94.7	104.7
Specific water consumption in households	l/inh.day	126.9	123.5	117.1

Source: Green report 2002

Development of the population connected to a drinking water supply system is shown in Table 2. Drinking water is consumed by Households and Other Users in a share of 66:34 (year 2001).

Table 2	Population	Connected	to	Public	Drinking	Water	Supply,	the	Development	in
	1990-2001									

% of population connected	1990	1995	1998	1999	2000	2001
Under municipal operation	2.2	3.1	4.1	4.3	4.5	4.3
Under W&WW utilities operation	73	76.3	77.7	74.5	74.6	74.9
Under other operation*	0	0	0	3.8	3.8	3.9
Total	75.2	79.4	81.8	82.6	82.9	83.6

Source: Green Report, 2002

* "under other operation" represents a newly established entities (for example Trencin) as mentioned in the chapter 2.2.2.

The household-specific consumption has a decreasing trend. This is thought to be caused by:

- an increase of water prices, and
- installment of meters at final consumer points.

Approximately 80-90% of the households' consumed water is metered. There are cases where this is technically impossible or meters were not installed yet. For those households where there are no water meters, there are two systems of charging for service:

- the charge is calculated based upon the total consumption from the water meter at the outlet of the operator that is divided by number of people living in the household, or
- the charge is estimated based upon the number of persons in households, usually 40 m³ per persons per year.

There is not a significant increase of water-saving devices. The specific household consumption varies within different regions in Slovakia. For example, in Bratislava, it was 182 l/p/day, while in other regions less than 80 l/p/day. The average specific households water consumption was 123 l/p/day in 2001. This difference in the consumption should be investigated.

Drinking water is distributed directly to households either living in individual houses or in block of flats. In the latter case, the owner of the block of flats is responsible for the technical status of the pipes. This means that any leakage, corrosion of pipes or other failures should be corrected by the owner of the block of flats. The data on drinking water distribution are listed in Table 1.

3.2 Water Processing/Cleaning/Disinfection

The processing and cleaning the water supply is conducted in the first or second stage of water supply treatment. Technical and technological requirements of the cleaning and disinfection are stated in the permit that operator obtains for his operation. Hygienic authorities inspect the enforcement of the permit. There are only cases of violation (failure in disinfection) as almost all facilities are equipped by automatic dose system of disinfectant. In case of extraordinary situation (after flooding), the owner of facility (municipality) must ensure an alternative source of drinking water.

3.3 Wastewater Production, Collection and Discharge

Development of public sewer systems is not as advanced as the water supply network. 54.3% of the population is connected to sewerage and this has not increased significantly over the last several years. The main users of sewerage are households and provide for 57.5% of the wastewater. The rest is for "Others Users" represented by industry, commercial and institutional, and administrative bodies. Almost all municipal wastewater entering WWTPs is treated by mechanical and biological treatment (96.4%).

The level of treatment and performance of treatment facilities differ, ceteris paribus. According to the Approximation Strategy (2001, DANCEE-MoE), there is a need to upgrade more than 200 WWTPs and construct more than 300 WWTP in order to meet the EU Directive on municipal treatment of wastewater. Data on wastewater treated and discharged into the recipient water bodies are shown in Table 3.

Parameter	Unit	1999	2000	2001
Length of sewer network	Km	5 166	5 220	5 266
Wastewater discharged, of which	Mill.m ³	252.1	240.3	231.1
Sanitary wastewaters	Mill.m ³	143.0	137.2	132.9
Industrial and other wastewater	Mill.m ³	109.1	103.1	98.2

Table 3	Wastewater Production	. Treatment and Discha	rge in 1999-2001
1 4010 0	i asteriater i roadetion	y i i caemente ana Disena	5° m 1/// 2001

Source: Green Report, 2002

Development of the population connected to wastewater treatment plants is shown in Table 4.

Table 4 Topulation Connected to WWT18 (Development in 1996 – 2001)								
% of population connected	1990	1995	1998	1999	2000	2001		
Under municipal operation	1.3	1.4	2.4	2.5	2.6	2.9		
Under W&WW utilities operation	49.4	51.1	51.6	48.7	49.0	49.1		
Under other operation*	0	0	0	3.1	3.1	3.2		
Total	50.7	52.5	54.0	54.3	54.7	55.2		

1 able 4 Population Connected to w w 1 PS (Development in 1990 – 2001	Table 4	Population Connected to WWTPs (Development in 1990 – 2001
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Source: Green Report, 2002

* same as in Table 2

4 Economic Data

4.1 Tariffs

Tariffs were set up for Households by the Ministry of Finance till 2002. The setting of tariff did not involve any examination of the specific production costs of operators. Tariffs for "Households" were identical through the whole country and all operators charged the same maximum permitted price per m³. The household bill is calculated on volumetric consumption of water (price multiply by volume of delivered water).

Tariffs for services to "Other User" clients were negotiated individually between the operator and the client. Many times it was the only way to recover the loss of "Household" clients. The parties to the negotiation of the tariffs were on the one hand the enterprise, and on the other - the operator of the W&WW services. The central Government did not influence these negotiations, but these negotiations could be strongly influenced by a market power and organization of the negotiating parties. Usually, the W&WW utility would set up the tariff in the whole district to which they provided the service. However, there were certain cases where the W&WW utilities set up different tariffs for "small" and "big" "Other User" clients.

Beginning in 2003, the National Office for Regulation of Network Sectors monitors and regulates water tariffs. Currently, the prices are not identical and might differ from region to region depending on operator production costs.

W&WW tariffs are subject to VAT (that was 6% in 1998, 10% by 2003 and 14% from 2003, 19% from January 2004).

Table 5 and Table 6 show the development of tariffs for drinking water and wastewater for households and average for other clients.

Table 5	Regulated Tariffs, Average Tariffs and Average Cost for Drinking Water Supply
	in 1998-2001

Parameter in SK/m ³	1998	1999	2000	2001
Tariff for households (without VAT)	5.66	7.26	8.36	10.08
Average tariff for others (without VAT)	15.98	16.26	17.20	18.36
Average costs of operators	10.45	10.80	12.36	13.76

Source: Green Report, 2002

Operators themselves, based upon the reporting requirements, report on costs. The operators –former W&WW utilities – are (were) not audited, as they are operating units belonging to the Ministry of Soil Management that takes the responsibility for supervision and budgeting. Thus, these operators are obliged to report on costs and revenues according rules applied for any public institution. Newly created operators will report to Municipal Boards and Municipal Councils (no more information available now).

Parameter in SK/m ³	1998	1999	2000	2001
Price for households (without VAT)	3.77	3.77	5.54	6.65
Average price for others (without VAT)	11.36	13.19	14.37	15.16
Average costs of operators	6.44	7.49	8.50	9.49

Table 6Regulated Tariffs, Average Tariffs and Average Cost for Wastewater Collection
and Treatment in 1998 – 2001

Source: Green Report 2002

4.2 Sales

Sales of W&WW services are shown in Table 7 (data from 2002 are not available).

Tuble 7 Sules of Water Services in 2001					
Parameter	Sale in mill. m ³	Share of s	Income (mill. SK)		
		Households	Others		
Drinking water	260.52	66.1	33.9	3 358	
Wastewater	231.15	57.5	42.5	2 373	

Table 7Sales of Water Services in 2001

Source: Green Report, 2002

4.3 Effluent Charges

According to the Water Act (2003), the polluter is obliged to treat wastewater according to the stateof-art technologies (that is secondary treatment at the minimum). The Water Act also requires treating wastewater to meet the emission limits. Therefore, there are cases that the polluter had to add a tertiary step in order to meet the standards.

According to Regulation on Pollution Charges (from 1979), each polluter must pay a water effluent charge. These charges are governed by a permit system and are levied based on self-monitoring by polluters (effluent quantities and concentrations reported by the polluters). The amount of charge depends upon the quantity of pollutants in the wastewater and on the quantity of the receiving waters. Base effluent charges are levied on 5 basic pollutants. Additional effluent charge penalties of up to 200% of the base rate may be levied to reflect a high level of damage to receiving waters. According to the law, these additional charges must be paid from after-tax profits. The charge rates are not adjusted to inflation.

Effluent charges are collected by SWME and were a funding source of the Slovak Environmental Fund. From 2001, the State Funds have been cancelled and the revenues go into the general state budget. The current and proposed computation algorithms for the effluent charge is in the Table 8. The income of the SEF from water effluent charges and water penalties is shown at Table 9 (data are

available till 2000, as the SEF was cancelled and from 2001, the water effluent charges and penalties are the income of the state budget. The statistic is not kept specifically on the water charges).

Parameter	1979-2003	Proposal of 2003
BOD5	21.5 * Z ^{0.8265} (in thous. SK)	12 SK/kg
Insoluble substances	2.34 * Z ^{0.7514} (in thous. SK)	2,40 SK/kg
Crude oil substances	$1.00 - 3.00 \text{ SK/m}^3$	
Alkalinity or acidity	135 SK/kmolle	
Dissolved inorganic salts	120-600 SK/t	0,50 SK/kg
Non-polar extractable substances	-	2 SK/kg
N _{anorg}		14 SK/kg
P _{total}		90 SK/kg
Cyanides total		2 800 SK/kg

Table 8	Structure of Effluent Charges in	Sk/unit
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Z- amount of pollution in tons per year

Source: working document of the MoE for the development of water pollution charges, 2001

Table 9Revenue for the SEF from Water Effluent Charges in mill SK

Parameter	1997	1998	1999	2000
Water effluent charge	194.8	215.1	198.5	197
Water effluent penalties	6.2	4.7	6.7	6.0

Source: Report of the SEF, 2001

4.4 Grants and Transfers

Grants and transfers come from

- State budget
- Water Fund (cancelled in 2001 the revenue and distribution of grant is under the ministry of Soil Management)
- Environmental Fund (cancelled in 2001, the revenue and distribution of grants is under the Ministry of Environment)

Grants are according to Slovak classification divided into "investments" and "non-investments" grants. "Investment grants" mean grants for the development of infrastructure (construction of water supply networks, WWTPs, sewer systems, irrigation facilities). "Non-investment grants" are transfers to recover production cost of operators; however, they also include R&D, monitoring, and planning activities. Table 10 shows state grants for two main water units: river basin enterprises (SWME) and W&WW utilities. The grants have decreasing trend.

In the past (not shown in the Table 10), substantial non-investment grants were provided for W&WW utilities to cover "costs of provision of tasks in public interest", or in other words to recover the production costs associated with household service users due to the limitation of the maximum allowable price. In recent years, non-investment subsidies were not allocated to W&WW utilities. This was due to state budget constrains rather then to correct the distortion in household tariffs. Also, there might be an explanation that the Government did not budget the W&WW utilities from 1996 due to planned decentralization (and possible privatization). In practice, it took more than 5 years for the final

decision on transfer: the Government let the W&WW utilities "dry out" and allowed the assets to depreciate (and lose value) before the completing the transfer to municipalities.).

Grants (mill. SK) to/from	Туре	SWME	WW utilities	
State hudget	Investment	214.2	650.4	
State budget	Non-investment	134.3	-	
Water Fund	Investment	-	28.3	
water Fund	Non-investment	150.0	-	
Environmental Fund	Investment	-	7.5	
Environmental Fund	Non-investment	-	-	

Table 10Grants to Water Operators in mill. SK in 2001

Source: Green Report, 2002

Cross-subsidies

There are several cross-subsidies situations:

- Cross-subsidies among different units of W&WW utilities, Providing subsidies to operators where the economic (and geographical and environmental) conditions are extremely unfavorable (and costly) for the operating unit (OZ) resulting in a financial loss. In areas where operators provided drinking water supply and sewerage services make a profit, that profit is reallocated among unprofitable OZ to attain a balanced budget in each of the units. Due to transformation of W&WW utilities enterprises this practice will end, and the water prices will increase more in those regions where the cost of providing W&WW services is very high.
- Cross-subsidies exist between two basic services drinking water supply and sewerage; while the first service is an unprofitable activity, it must be subsidized by the second one.
- Cross-subsidies exist among "Households" and "Other Users"; due to the maximum allowable price for households, re-allocation of the revenues from Other Users is used to offset loses from "Household" tariffs that are less than the cost of providing that service..

5 Infrastructure of Municipal Water and Wastewater Services

5.1 Production and Processing of Municipal Water

The public water supply services 82.6 % of the population. There do exist different regional levels of water supply, e.g. Bratislava, Prievidza, Martin, Banska Bystrica with the highest supply rate of 94 % and a worse situation in the rural areas in eastern and southern Slovakia, with a supply rate of approximately 50 % (Vranov nad Toplou, Sabinov, Bytca, Kosice-okolie). Drinking water is produced from ground water sources (more than 80%) and from surface water. There is a decreasing trend in the consumption of drinking water that might cause operational problems in the production and distribution systems. Typical drinking water supply system consists of well, distribution system (main and network pipes), treatment facility (one-stage or two stage), pumping system, water reservoirs. A typical problem with the drinking water supply is a high percentage of losses in distribution (on average more than 25%).

5.2 Collection, Processing and Discharge of Municipal Wastewater

The sewer systems and wastewater treatment plants are behind the overall development of Slovakia's economy and society. Only 55% of inhabitants are connected to a sewer system. There are 205 municipal wastewater treatment plants (as of December 2000) that treat municipal (in most cases municipal and industrial) waters of which:

3.8 % of wastewater is discharged only after the mechanical treatment

96.2 % of wastewater is discharged after mechanical and biological treatment.

There are cases when a biological nutrient removal step is already installed in existing WWTPs. however, most of WWTPs are obsolete and will require both upgrade and modernization to achieve higher levels of nutrient pollution reduction, including nutrient removal.

According to the EU Urban Wastewater Directive, agglomerations larger than 2000 pe must be connected to sewer and wastewater treatment systems. Currently, it is reported that only 12 WWTPs currently meet the EU obligations and would not need any change. There are 290 municipalities in the category of 2000 - 5000 pe without any WWTPs in place. According to estimates in a DANCEE – MoE study, the number and type of WWTP to be constructed or upgraded are as follows:

- 287 new plants with technology to remove organic pollution with the complete nitrification
- 3 new plants with the technology to remove organic pollution with an enhanced biological removal of N_{tot} and P_{tot} (by chemical or biological methods)
- 243 existing plants that need an upgrade that will include complete nitrification and/or nutrient removal.

The changes in technologies, new connections and upgrade will result in increased generation of sludge. In 2000, 98 920 tons of dry sludge was produced of which more than 40% was disposed by land filling and the rest was applied on agricultural (or forestry) land.

6 Management Units

6.1 Types and Number of Management Units

Types and basic features on the administrative and management arrangements were described in the chapter 2.2.

In the early part of the 90s, W&WW services were 100% operated by the state-owned W&WW utilities although according to the Act on Municipalities (1990), these tasks were given to municipalities (which mandated W&WW utilities to operate W&WW services). In a few cases municipalities mobilized financial sources to construct and operate W&WW services.

6.1.1 Trends in Formation and Consolidation of the MUs

Process of decentralization of W&WW services was launched in 1996. That was a period of dramatic situations, and several conflicts and problems attended the decentralization process:

- The Ministry of Finance regulated the maximum prices applied to municipal consumers (thus, the transformed W&WW services operators would operate in a distorted market)
- The Ministry of Soil Management lacked the capacity to process and approve transformation projects received from applicants. In addition, the application process was without feedback to those who prepared transformation projects.
- The Act on Water Works Utilities was for a long time pending the approval in the Government, thus it was not clear what rules (type of ownership, concession, lease, full divestment) would be applied to new operators of water services
- Municipalities without water infrastructure in place were excluded from the transformation
- Municipalities (agglomerations of concentrated industries), where water supply and sewerage services resulted in the profit, were not willing to join W&WW companies with other municipalities in the region that had money-losing systems
- Transformation projects were to be prepared by the W&WW utilities and the cost to develop the project was borne by these state-owned companies
- Transformation process was based upon a voluntary approach without a final schedule
- Municipalities were reluctant to receive facilities under construction due to a lack of finances, as the Government did not allocate resources for completion
- In addition, municipalities were reluctant to take over the services due to unclear future development in tax, price, insurance and depreciation policies.

According to the new Water Works Utilities Act (2002), any physical or legal person could be owner and/or operator of water services.

6.1.2 Lines of Business

WW utilities are purely W&WW service providers, and do not engage in any other business lines. They might probably provide some commercial services, for example activities related to civic and mechanical works, laboratory analyses, consultancy services. These activities are not mandatory and are provided in individual cases. It is not allowed to include these costs of providing these commercial services into the production costs for calculation of maximum prices.

6.2 MU Service Areas and Service Provided

W&WW services were (till 2002) provided by 5 W&WW utilities that were subdivided into 47 small operation units (odstepne zavody - OZ). These W&WW utilities are being decentralized (transferred) into municipal water companies. The decentralization of state-owned W&WW utilities were scheduled to be completed at the end of 2003 but it is not yet possible to precisely describe the service areas.

For example, original East Slovakian W&WW utility is being split into two water companies: East Slovakian Water Company and Podtatranska Water Company. Both are a successor of the state-owned W&WW utility.

The West W&WW utilities are spilt already into 3 successors' municipal water companies. Municipalities that are serviced by these companies have shares based upon the size of their population. The general rule is that responsibilities and costs (investment and operating) will fall into new municipal water companies that will be allowed to enter public-private partnerships. However, the service monopoly in the service area of any given company will persist.

In addition, a few water companies have been established in the period of 1996–1998, when the process of decentralization was launched.

6.3 Population Served by the MUs

In 2001, about 83.6 % of the population is provided with drinking water, but only 55.2 % of the population is connected to the public sewage system. The common problem is that there are differences in connection of inhabitants depending on the region. While in Bratislava, the connection (both to drinking water and sewer system) reaches almost 100%, there are regions of low (less than 20%) of connections.

6.4 Special Obligations

Payment discipline of household accounts is very high. There are exceptional cases, where households' consumers did not pay the bill and the W&WW utility for limited period stopped providing water services. A more sensitive situation occurs in the case of the unpaid water and wastewater bill of schools, hospitals and other public institutions. According to the statistic record of the Ministry of Soil Management, in 2001 the unpaid claims of W&WW utilities reached 2 158 mill. SK due to the insolvency of clients. As a consequence, these operation units end up with debts. The Table 11 shows claims and debts of W&WW utilities and SWME.

Parameter	Year	WW utilities	SWME
Accounts receivable	2000	2054.5	1137.3
	2001	2158.5	1120.7
Accounts receivable past due	2000	1088.2	679.7
	2001	1175.9	718.9
Debts of operator	2000	926.6	299.9
	2001	1103.1	287.8
Debts of operator past due	2000	374.7	92.2
	2001	288.1	85.7

Table 11Claims and Debts (mill SK) in 2000, 2001

Source: Green Report, 2002

6.5 Financial Conditions

W&WW utilities keep accounts. Some are publicly available.

In the past financial plans were developed at the level of big regional W&WW utilities and investments were undertaken based upon the decision and capacities of the Ministry of Soil Management (and the Government). In general, it is reported that deep under-financing of water sector brought the W&WW services to its critical situation. Project preparation and planning was not realistic and usually ended up with the "wish list" of never implemented projects.

7 Regulatory Units

7.1 National, Basin and Local Planning and Permitting

National planning of development of water infrastructure is under the Ministry of Soil Management. It developed Water Management Policy till 2005 (Koncepcia vodohospodarskej politiky do roku 2005). According to this plan, the following estimates are provided:

- Investment Programme for the development of public drinking water supply system 6.95 bill. SK that includes an increase the level of water supply from 82.6 % to 85 % of the Slovak population by 2005.
- Investment Programme for the development of sewage network and treatment 36 billion SK by 2005 of which 2.9 bill. Sk is needed to complete the construction and upgrade of existing sewage systems and WWTPs. It is planned that the connection rate will be 57% of population by 2005.

At the national level, planning is limited to "annual" budgeting, and the support for future investments (with respect to the commitment to meet the EU directives) is only politically declared. Existing national plans lack the concrete steps and mechanisms how and from what sources will these expenditures be financed (the Water Management Policy refers to ISPA, Phare and other EU funds, commercial loans, municipal budgets, and support of the Government in a very general sense). Recently, the Strategy on the Implementation of EU Water Framework Directive was adopted (December 2003), that refers to the implementation of new requirements related to the transposition of the EU Water Framework Directive. It does not deal with investment plans to provide W&WW services.

At regional (river basin) level, there is so called Master plan that is revised biannually. It focuses more on the description of the situation rather than planning. No links are made to national or local planning documents.

Besides national planning, municipalities themselves establish development plans that include all public infrastructure. Approximately half of the municipalities have detailed engineering plans to construct wastewater facilities; few of them have already been constructed.

Municipalities usually requested the financing from the Slovak Environmental Fund (it was cancelled in 2001 and grants are available from the Ministry of Environment). Actually, they saw the SEF grants as the only source of water infrastructure financing. Several reasons were cited:

- the SEF allocated grants: that means free of interest or principle payments
- the SEF did not requested any "detailed" economic analysis (assessment) of the project
- the SEF did not analyzed any "environmental improvements" of implemented project
- the SEF did not requested co-financing from other sources.

The allocation of grants was not coordinated with the pre-accession funds that focused on large infrastructure projects. The SEF allocations were politically popular as they dealt with small-scale water projects. Table 12 shows the allocation of grants to water infrastructure projects.

Parameter	1996	1997	1998	1999	2000	2001	2002
Water supply	221.9	189.3	263.7	0	153.5	160.5	186.5
Sewage and treatment	398.2	326.9	408.1	2.5	547.7	635.1	847.0
Other water projects	29.7	16.9	33.3	16.9	-	-	-

Table 12SEF Expenditures in mill SK (1996 – 2002)

Source: SEF report, 2003

At the level of W&WW service operators, there is not a clear picture how to prioritize the future investments. Financial demands clearly exceed internal capabilities of operators and range from recovery of water losses, reconstruction of facilities that are obsolete, new investments to meet stricter environmental limits, and new connection of inhabitants to public W&WW services.

7.2 Economic Regulations and Limitations

Economic regulation is from 2003 at the National Office for Regulation of Network Sectors (NRO). Each provider of W&WW services (more than 50 inhabitants or daily water production more than 10 m³) must apply for the permit to charge "households" and "other service users" in a given year. The NRO issues the decision for each individual provider that is available to the public (details on regulation and setting the maximum tariffs are described in the Chapter 2.4.). The NRO was established originally for the regulation of natural monopolies (such as electricity, gas), and embraced the water services when the decentralization of state own water companies was launched. While in the case of regulation of electricity and gas tariffs the Office has a mandate to issue the penalty (in case of violation of the decisions granted by the Office) this is not a case for the water services. Therefore, the NRO as it is designed currently, has very symbolic functions over the regulation of water services.

7.3 Environmental Regulations and Restrictions

The Water Act (2003) requires each discharger to treat water prior to the discharge to the surface or ground waters. The implementing regulations set emission limits and effluent charges. The details are described at the Chapter 2.4. The Water Act transposed all water related directives of the EU including the Directive on Urban Wastewater Treatment that requires all municipal treatment plants to install the secondary treatment step at minimum. This requires heavy investments and it is anticipated that majority of environmental financial support from the EU funds will be spent for the (re)construction of WWTPs in Slovakia.

8 Service Users

8.1 MU Customers

MU customers are households (approximately 60 % of drinking water and 50% of wastewater services) and industries. Operators in general differentiate between large industries (conducting heavy industrial activities) and small industries (small enterprises and commercial agencies that have similar to household wastewater production) due to different tariffs applied. Also, there are other service users similar to household entities; such as student hostels, orphanages, retirement houses; for which the regulated household tariffs apply. It should be noted, that this group with "lower" water tariff can not conduct any commercial activity that would generate a profit.

8.2 Self-Supply Users

Self suppliers consists of households mainly in rural areas, although there are few in cities with more than 10 000 inhabitants without sewage systems so they have to "self-supply" sewerage services. This is not the case for drinking water supply; all inhabitants of the larger communities are served.

15% of the population obtains drinking water from personal wells. There is no monitoring of the quality or quantity of these withdrawals.

Many households are not connected to sewage system - 44% of households dispose wastewater in septic systems. Most are holding tanks and the content is regularly (minimum once per year) removed and taken to wastewater treatment plant. Municipal office might undertake inspection to assure that the holding tank was emptied by an authorized sewerage collection truck. No record would prove that the municipalities conduct the inspection.

If the self-service user would like to discharge the wastewater into soil, they need to have a permit from the district environmental office. However, direct discharge without the pretreatment is not allowed. There is no information on how many users built individual small treatment facilities.

9 Policy Issues

The principle of costs recovery for water services is expressed in the Water Framework Directive. Specifically, the Directive requires ensuring that the price charged for services related to water reflects the true economic costs of providing the service. Current water tariffs and pollution charges are not determined on the basis of cost-recovery. This has a historical roots ranging from legal, institutional and technical reasons.

Inherited problems:

- Past central budget allocations were for construction and equipment. This provided an incentive to over-design (substitute fixed capital for operating expenses like labor and materials).
- Budget allocation based on political influence provided as much as (more than?) needed and led to an unbalanced portfolio of plant and equipment in the various communities. A physical legacy but a behavioral legacy as well.
- Lack of management skills due to limited training and experience. Current MU staff never before
 had responsibility to do investment and tariff planning for the system.

9.1 Legal and Institutional Issues

Transformation (and privatization) allows for provision and responsibility of water services at local (municipal) level. This is a good signal that the central government will have a "regulatory" rather than "provider" function.

From 2003, the transformed W&WW service companies are being established and municipal water companies provide W&WW services to several municipalities. Municipalities (by the decision of Municipal Boards) might delegate maintenance and operation to a municipal or private company. Also, it might be the case that municipal boards could decide to sell bonds to a private company (this option has not been tested, yet). Except few cases, there is not any experience on what will be, in practice, the relationship between municipal boards and operators. On one hand, municipalities welcome transformation of assets as they increase the total assets of municipalities. On the other hand, municipalities are reluctant to take over the responsibilities as they declare that the Government did not allocate any financial sources to maintain existing facilities. The main problem is that the allocation of shares was done based upon the size of municipality, regardless of the actual service provided. Also, those municipalities that did not have any service received the shares in newly established municipal water companies. An additional problem is that those municipalities that operated their own water services are under the pressure to give up the operation and transfer the assets into a large municipal water company.

There are several other problems:

- Municipal authorities are not trained to make contracts and to deal with private companies
- Municipalities are not ready to plan new investments due to the lack of expertise and will rely on
 operators' proposals
- Municipalities do not have a tradition of, or practice in, working in partnership with each other. They usually regard each other as economic competitors and this is amplified by the fact that representatives of different and competing national political parties are often in charge of municipal affairs.
- Municipalities are not aware of environmental requirements, as they were not part of legislative process of EU accession.

Till now, municipalities and municipal governments have been "passive" players in the transformation process. Old W&WW utilities were turned into municipal water companies without any assessment

and review of their economic portfolio and performance. Anticipated problems will come when new investments should be done and clearly, municipalities are not prepared to make informed and experienced decisions.

Proposal to resolve problems:

- establish a clear (unambiguous) responsibility of Municipal Boards
- develop clear contracting conditions between municipalities and operators
- establish transparent organization structure of operators and management

9.2 Tariffs Structure

In the past, the tariffs for Households were limited and uniformly applied by the Resolution of the Ministry of Finance. Other user's tariffs were set by negotiations conducted between the operator and commercial customer. This resulted in several problems:

- production costs of operators exceeded the maximum prices of households. Operators used their market power (as monopoly suppliers of municipal water) to negotiate higher tariffs with other customers so that total costs were balanced.
- production costs of operators in technical or hydrological unfavorable localities exceeded total costs and were balanced by cross subsidies of other localities served by the state-owned regional water company.
- production costs for drinking water supply were cross subsidized by the revenues from wastewater treatment services
- annual governmental subsidies did not encourage the economic efficiency of operators or improve the water infrastructure. Now the central government is itself short of resources and annual assistance (subsidies) has declined and practically stopped.

Currently, the National Office of Regulation of Network Sectors has regulatory oversight over gas, electricity, and water utilities. It has a regulatory task to establish tariffs for both Households and Other Users. However, distortion between Households and Other Users still persists. In some localities (service areas where the share of Household users is higher than Other Users) the difference between water prices for Households and Other Users is magnified in order to cover costs..

The water tariff structure is based on volumetric tariff system without any "fixed" or "connection" charge. Recently, new clients are obliged to pay a "one-time" installation charge.

The response of users is to reduce or save water consumption that is provided by the public operators and, in extreme cases, to switch water sources and wastewater services (withdrawal of water individual wells or surface water, construction of own WWTPs). Pollution load of users (those using public water services) is not specifically addressed in the final calculation of the tariffs. Their pollution load probably should be considered and there are a few examples, where the W&WW operator designed tariffs for Other Users based upon the pollution entering the public WWTP.

The operator does not have substantial incentive to reduce internal operation costs. The main reasons are:

- Households tariffs are indexed and calculated based upon the previous year basis regardless of production costs and the rest of production cost must be recovered from Other Users
- Tariffs (both for drinking water and sewage water) are calculated in a way that a final tariff includes 10 – 15% net revenue of the water company. Improved effectiveness (and thus reduction of operation costs) would lead to a decrease of this accounting profit since it is calculated as a percentage of cost. This discourages cost control at the MWWU.
- Violation of the decision granted by the National Regulatory Office is not a subject of penalty.

The simple computer models dealing with economic assessment (already developed at ICPDR, OECD and other international programs) exist and would be in benefit of operators (and the National Regulatory Office). However, these models are not tested at operator levels at the scale that would give a better understanding to efficiency options. It is important to make a clear transparency of the cost-income structure of the operator. In other words, many international projects resulted in development of models to assess tariffs, charges. But results were never tested in a real water companies. Operators are obliged to break down cost items for accounting purposes, but never for internal use to see the structure of costs and revenues or to model different scenarios (for example for the future investments).

In addition to regular annual increases in prices, households are faced to an increase of the VAT that is attached to the water price. The VAT increased from 10 to 14% (from 2004 it will be 19%) over the last 5 years.

Proposal to resolve the problem:

- removal of indexing of Households tariffs and application of actual production costs at each MWWU as the basis for tariffs for service users that are households.
- Shift the NRO function to economic regulation of natural monopolies rather than calculation of maximum Household and Other User tariffs.

9.3 Effluent Charges

As described above, the effluent charges have neither incentive nor revenue raising functions. In addition, formulas used for the calculation of pollution load are designed to produce more (probably diluted) wastewater rather than increase the efficiency of treatment. Plans to amend the Regulation on Effluent Charges (that dates from 1979) have been delayed. There is an attempt by a few research institutes to investigate the impact of pollution abatement cost and pollution charge per unit.

Two dimensions of effluent charges might be considered:

- Effluent charges *paid by W&WW operators are too low* to produce an effective incentive for the W&WW operator to invest into abatement technologies. New, more stringent emission limits however may help encourage W&WW operators to reduce pollution loads.
- Effluent charge to be *paid by industry using W&WW service*; in general, the tariff of wastewater does not address the specific pollution load. The industry is obliged to pre-treat wastewaters prior to the discharge into the public sewage system to meet the requirements of Sewage Order. This is signed between operator and the industry and might be inspected by the environmental authority. There are some cases that specific industry pollution (for example food and chemical industries that discharge pollution that might upset the operation of the public WWTP) is considered when the tariff is negotiated. However, the main driving force to increase the tariff of industry users is to recover the deficit caused by limited tariffs of Household users.

Proposal to resolve the problems:

- effluent charge should address two aspects:
 - o pollution load of discharged wastewater
 - o efficiency of treatment
- in setting wastewater tariffs, operators of W&WW services should incorporate pollution load from industrial clients based upon the quality of pollution (in the case that operation costs are higher due to an upset of public WWTP, for example caused by bulking sludge as a result of starchy waters from a food industry, etc.)
- enforcement of effluent charges should be improved. There should not be so much latitude for interpretation of the Regulation, allowing for reductions in the calculated final effluent charge
- there might be an incentive to delay effluent charge in the case of investment that leads to the reduction of final pollution load.

- Collection of effluent charges should be documented and reported to the public.

Efficiency of the policy proposal should be tested at the national level. It is suggested to open a public discussion with respect to issues of efficiency, equity and benefits commensurate with the costs. The following table highlights the important advantages and limitations of the strategy proposals.

Strategy Name	Strategy description	Comments/Concerns
Revision of legal and institutional arrangement	Establish a clear (unambiguous) responsibility of Municipal Boards Develop clear contracting conditions between municipalities and operators Establish transparent organization structure of operators and management	Training of municipal representatives needed
Introduction of regulation over monopolies	Revisiting the role of National Office for Regulation of Network Sectors Examination of individual constituents of costs and tariffs Clear description of cost items including depreciation and future savings Removal of indexing HH tariffs Independent auditing Allow for increasing/decreasing block tariffs Informing the public about future rising costs	Time consuming legislative process Needs to improve enforcement
Introduction of cost center	Examination of individual constituents of costs and tariffs Examination of two-part tariff structure Clear description of cost items including depreciation and future savings Development and use of costing models	Increase costs in a short-term Unwillingness of operator to introduce a cost center with the argument of an additional burden to "reporting" requirements Unwillingness of municipal boards to be involved in examination with the argument of highly specialized issue to deal with at political level High willingness of industry to participate
Revision of pollution charges	Examination of unit cost of pollution reduction Allow for payment holidays in case of mitigation investments Allow for increasing/decreasing tariff depending on input pollution load (mainly valid for industry) Public assess to information on pollution charges	Needs to improve enforcement and monitoring of polluters Transaction costs with respect to monitoring and public assess

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September 2004

ASSESSMENT AND DEVELOPMENT OF MUNICIPAL WATER AND WASTEWATER TARIFFS AND EFFLUENT CHARGES IN THE DANUBE RIVER BASIN.

Volume 2: Country-Specific Issues and Proposed Tariff and Charge Reforms: Slovak Republic – Case Study



WORKING FOR THE DANUBE AND ITS PEOPLE


AUTHORS

Danka Thalmeinerová



PREFACE

The Danube Regional Project (DRP) consists of several components and numerous activities, one of which was "Assessment and Development of Municipal Water and Wastewater Tariffs and Effluent Charges in the Danube River Basin" (A grouping of activities 1.6 and 1.7 of Project Component 1). This work often took the shorthand name "Tariffs and Effluent Charges Project" and Phase I of this work was undertaken by a team of country, regional, and international consultants. Phase I of the UNDP/GEF DRP ended in mid-2004 and many of the results of Phase I the Tariffs and Effluent Charges Project are reported in two volumes.

Volume 1 is entitled *An Overview of Tariff and Effluent Charge Reform Issues and Proposals*. Volume 1 builds on all other project outputs. It reviews the methodology and tools developed and applied by the Project team; introduces some of the economic theory and international experience germane to design and performance of tariffs and charges; describes general conditions, tariff regimes, and effluent charges currently applicable to municipal water and wastewater systems in the region; and describes and develops in a structured way a initial series of tariff, effluent charge and related institutional reform proposals.

Volume 2 is entitled *Country-Specific Issues and Proposed Tariff and Charge Reforms*. It consists of country reports for each of the seven countries examined most extensively by our project. Each country report, in turn, consists of three documents: a case study, a national profile, and a brief introduction and summary document. The principle author(s) of the seven country reports were the country consultants of the Project Team.

The authors of the Volume 2 components prepared these documents in 2003 and early 2004. The documents are as up to date as the authors could make them, usually including some discussion of anticipated changes or legislation under development. Still, the reader should be advised that an extended review process may have meant that new data are now available and some of the institutional detail pertaining to a specific country or case study community may now be out of date.

All documents in electronic version – Volume 1 and Volume 2 - may be read or printed from the DRP web site (<u>www.undp-drp.org</u>), from the page <u>Activities /</u> <u>Policies / Tariffs and Charges / Final Reports Phase 1</u>.



We want to thank the authors of these country-specific documents for their professional care and personal devotion to the Tariffs and Effluent Charges Project. It has been a pleasure to work with, and learn from, them throughout the course of the Project.

One purpose of the Tariffs and Effluent Charges Project was to promote a structured discussion that would encourage further consideration, testing, and adoption of various tariff and effluent charge reform proposals. As leaders and coordinators of the Project, the interested reader is welcome to contact either of us with questions or suggestions regarding the discussion and proposals included in either volume of the Project reports. We will forward questions or issues better addressed by the authors of these country-specific documents directly to them.

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Abbreviations

ASTEC Model	Account Simulations for Tariffs and Effluent Charges Model
BOD	Biological oxygen demand
COD	Chemical oxygen demand
FCR	Full cost recovery
HH	household
IND	industry
M(B) WWTP	Mechanical (biological) wastewater treatment plant
MCP	Marginal cost pricing
MU	Management unit
NRO	National Office of Regulation of Network Services
OZ	Odstepny zavod – branch of WW utility
РСН	Pollution charge
PP	Poprad District
PPB	Poprad Branch
PWC	Podtatranska Water Company
RU	Regulatory unit
SL	Stara Lubovna district
SNV	Spiska Nova Ves district
SS	Suspended solids
SU	Service user
UCH	User charge
W&WW services	Water and wastewater services
W&WW utility	Water and wastewater utility

5

1 Introduction

1.1 Purpose of the Case Study

This report describes the recent history, current conditions, and planned development of the case study community in the northern part of Slovakia: Poprad¹. This examination includes development of several sets of financial "accounts" that are used to make a broad examination of both the current balance sheet of the typical management unit – municipal water company in the district of Poprad and the future financial implication of various investment programs and, of course, changes in the tariffs levied and effluent charges paid by the management unit and its customers. The purpose of this examination is to provide a more concrete background and specific insight for use in identifying and evaluating selected institutional and policy reforms connected to water and wastewater tariffs and effluent charges in Slovakia. This is meant to complement the identification and discussion of some of these same institutional and policy reforms as contained in the accompanying Slovak National Profile Report.

1.2 Case Selected

The selected case belongs to the Podtatranska Water Company (PWC) that was established in May 2003 as a share holding company. The PWC area of responsibility comprises 6 administrative districts. The PWC consists of 3 branch offices (former odstepne zavody - OZ). The total number of municipalities covered by the PWC is 205 with the total population of 381 388 inhabitants. While the case study covers the whole PWC service area, attention is focused on the Poprad Branch (PPB).

The selection for this case study was done due to the data available as for this service area and willingness of the management to participate at the project. Also, the PWC has prepared an investment plan that consists of construction of a new WWTP and new connections.

The service area is located in northeast Slovakia, in a broad mountain valley and the main activities are in tourism, engineering, chemical, and food industries. The area of the PPB consists of the following settlements:

- Poprad district (includes Poprad city and 7 surrounding villages), 72 241 inhabitants, and several industrial activities such as heating and cooking equipment production, kitchen and washing machines production, automatic machines for hot and cold drinks, brewery and canning plant. Inhabitants and industry are connected to drinking water supply and the old (and obsolete) WWTP. Industry also uses the water and sewer system support manufacturing and non-manufacturing facilities. Prior to discharge into the public sewer system, industrial wastewater customers must ensure that the quality of wastewater will not upset the operation of the public W&WW system. However, some industrial facilities also use some private water sources for some processing activities.
- Industrial agglomeration of Svit town, 9 174 inhabitants (that includes also one small neighboring village), with the job opportunities in chemical and textile companies (viscose fiber and engineering production, textile production). Although the inhabitants of the town Svit are collected to the sewer system, the wastewaters are discharged without treatment directly into a recipient water body. Over 90% of inhabitants are connected to the drinking water supply.

¹ As in most of the work of the Tariff and Charges Project, the term "municipal" refers to local water and wastewater service providers and can, as in the case of Poprad, include service to surrounding communities or even a regional utility serving multiple municipalities.

- Agglomeration of three tourist villages at Smokovce, with a total of 4 509 inhabitants, with several hotels, camping bungalows and motels. It is estimated that 1 500 tourists per day (!) visit this area during the winter season. This agglomeration is connected to the drinking water supply, only a minor part of wastewater is collected and discharged directly into the recipient water body, the rest is disposed of in holding tanks.
- Agglomeration of three smaller tourist villages at Strba, located at the foot of the mountains, totaling 7 549 inhabitants and in the tourist season, there is additional 10 000 tourists per day. Most employment is in the tourist industry. This agglomeration is connected to the existing WWTP that needs replacement.

All these agglomerations are connected to the drinking water supply system (connection percentage is from 86 to 100%) and sewer and wastewater treatment system (from 55 to 92%).

The service area also includes industry (as mentioned above). For the purposes of the case study these are grouped into:

- "Large industry" (some 10 large factories), that is served by W&WW services but prior to the discharge, industrial waters are pre-treated. The requirements of outlet wastewaters from the industry is stipulated in the Sewerage Order (authorized permit to discharge wastewater from the industrial facility into the public sewage system). Besides the public W&WW service, some industries have their own W&WW system for certain activities.
- "Small industry" that comprises some infrastructure enterprises and institutions (commercial offices, schools, hospital, restaurants, local brewery, meat industry, canning industry).

2 Poprad Case Study Setting

2.1 History and Evolution of the Current Organization

Before May 2003, the selected area belonged to one of five large state-owned companies – Eastern Slovakian W&WW utility. This W&WW utility was split into two larger units (PWC and Kosice Water Company) as the result of decentralization. The Eastern Slovakian W&WW utility belonged to one of the most underdeveloped region in Slovakia with the high share of unemployment (20 - 30% varying in different districts, however there are settlements with more than 50% unemployment). In the PWC service area, 76% of inhabitants are connected to drinking water supply and 51% to sewer system (year 2001).

2.2 The Current Organization of Water and Wastewater Provision

The Podtatranska Water Company (PWC) is composed of the Head Office and three branches. The head Office is located in the district town of Poprad (the recruitment of employees is being conducted now and it is planned to reach 30 employees in 2005). There are three branches: in Poprad (275 employees), Spisska Nova Ves (240 employees) and Stara Lubovna (110 employees). There is a plan that by 2005, there will be a reduction in total employees from 625 employees to 595 employees.

Table 1 summarizes the current PWC activities, grouped in three branch units (Poprad (PPB), Spiska Nova Ves (SNV), and Stara Lubovna(SL)).

Parameter	Unit	PPB	SNV	SL		
Water supply	•					
Connected inhabitants	Inhabitants	139 799	104 220	32 482		
Coverage ratio	%	88.2	76.4	73.7		
Amount of drinking water produced	Thous. m ³ /year	15 264	4 149	1 593		
Amount of drinking water invoiced	Thous. m ³ /year	8 4 5 1	4 965	1 271		
Income from drinking water service	Thous. SK/year	131 551	67 993	17 656		
Share of invoiced water of households on the total produced water	%	58	74	73		
Wastewater collection						
Connected inhabitants	Inhabitants	94 319	83 369	16 041		
Coverage ratio	%	67.3	60.3	36.4		
Amount of wastewater collected	Thous. m ³ /year	7 385	4 499	1 012		
Income from wastewater service	Thous SK/year	86 151	45 587	12 744		
Share of households on the total sewerage services	%	51	68	64		
Wastewater treatment plants						
Number of plants		18	6	3		
of which mechanical WWTP		1	2	0		
mechanical - biological MB WWTP		17	4	3		
Total capacity of WWTP	m^3/d	37 882	29 376	12 153		

Table 1Connection of Inhabitants to W&WW Systems, 2002

Source: Data on investment and operation in Slovakia, Water Research Institute, 2001 and internal statistical data of the PWC, 2003

The main functions related to investment activities are concentrated at the Head Office including the preparation and implementation of major investments. Legal and contractual activities are also the responsibility of the Head Office including the design and development of tariffs. The branch offices are responsible for operation and maintenance of assets (water sources, district water supply networks, sewer systems and WWTPs). A limited responsibility of branch offices is investment planning but that is restricted to purchase of plant operational machinery, laboratory and monitoring equipment, water meters, pumps. Planning and implementation of major investments is the responsibility of the Head Office and is done according to the investment plan of the company.

The PWC conducts mandatory activities that are:

- production and distribution of water via water distribution networks
- collection and treatment of wastewater
- maintenance of distribution networks
- preparation of investments, design and engineering of investments
- mandated civic protection and assistance activities.

Besides mandatory activities, the PWC could undertake:

- activities related to civil and mechanical works, transport, including construction services
- laboratory analyses and diagnostics
- operating human resources development and recreational units,
- computer centers (GIS system and maps), including commercial activities
- provision of other economic activities such as consultancy.

The arrangement between W&WW system owner (municipalities) and the PWC is evolving. As of December 2003 the assets are under ownership of the National Property Fund. The assets are to be transferred to the municipalities. All mayors in the district will have the shares depending on the community population regardless of the extent of services provided. That means that those municipalities that are not service users but are located in the jurisdiction of the district will have shares. A Council, consisting of the representatives of respective municipalities, will establish the new, municipally-owned water company. The new municipal water company must be (will be) established by the end of 2003.

Poprad Branch Unit

Poprad Branch (PPB) Office is the focus of the case study. The PPB is responsible for operating the water and sewer infrastructure at the territory of the Poprad district as well as the other district of the Branch. There are 140 675 household consumers (drinking water) and 94 952 household consumers (wastewater collection and treatment). Industrial companies, commercial and institutional enterprises are also consumers of W&WW services provided by the PPB. Wastewater collected from households represents 5 086 000 m3 (22%), the industry represents 3 520 000 m3 (15%), other consumers (excluding households) and run-off and infiltration represent 14 790 000 m3 (63%).

Case study unit

The PPB includes the following consumers:

- households that are served by both water and wastewater services
- households that are served by both water and wastewater services, but the wastewater is not treated and is directly discharged into the recipient
- households that are served by drinking water
- large industry with 25 000 pe, in total,
- and small industry and commercial institutions and organizations with 20 000 pe, in total.

All agglomerations are connected to drinking a water supply with connection rates varying from 83 - 99%.



Diagram of relationships

2.3. Relationship among MU, RU, SU

2.2.1 Economic Relationships

The MU (PWC) provides W&WW services to inhabitants, industry and other commercial and institutional enterprises. The contracts are signed individually with all SUs. In the case of inhabitants, meters are being gradually installed for individual households. The penetration of household meters has reached 96%. It should be understand that PWC often treats blocks of residential flats as a single account. It will issue a one single water bill for the block of flats and it is responsibility of owner(s) of the block of flats to redistribute W&WW bill among households (that are metered). For those blocks of flats and households without the meters, estimated water consumption per capita (the range from 16 to 40 m3/capita/year is applied) is the basis for the water bill. Totally, there are approximately 140 000 customer accounts of which one third are companies and the rest are accounts for residential customers.

Industry before the discharge of its wastewaters into public sewer system must have pre-treatment to avoid damaging the effectiveness of the treatment processes of the WWTP. The conditions of industrial discharges are listed in individual contracts and must meet the Sewer Order (the Sewer Order is approved by the Environmental Department of District Office). Share of inhabitants and industry that use W&WW services and data measured at "point of use" are shown in Table 2

	Provided drinking water
Households	4 896
Industry large	1 185
Industry small	2 370
Share of households on total water consumption (%)	58
Collected wastewater	
Sanitary (households)	3 802
Industrial	3 583
Share of households on the total production of wastewater (%)	51

Amount of Invoiced Water and Collected Wastewater, 2002, (thous. m³/year) Table 2

Source: vykaz Vod Z 1-01, 2002

Management Relationship 2.2.2

The Poprad Branch (PPB) unit is one of three branches of the PWC. The PWC makes all-important decisions including investment planning, and tariffs proposals.

2.2.3 **Regulatory Relationships – Economic**

The maximum water tariff for households in this district is fixed by the Decision of National Office of Regulation of Network Services (NRO) and for the year 2003 it was set at 16.07 SK/m3 (with VAT) for drinking water and 10.15 SK/m3 (with VAT) for wastewater collection and treatment.

Industrial users have individual contracts, but the NRO also limits these tariffs. In 2003 the maximum tariff was set at 36.48 SK/m3 (drinking water) and 26.22 SK/m3 (wastewater collection and treatment).

The effective tariffs (as opposed to the maximum tariffs just discussed) for both residential and industrial accounts (as opposed to the maximum tariffs just discussed) are proposed by the PWC. A complex formula for the calculation of tariffs is involved. The NRO determines an important coefficient used in the formulas. The coefficient of annual increase of water tariff for 2003 for households is 1.35 for drinking water and 1.30 for wastewater. Table 3 shows the progression of maximum tariffs for each year as determined by the NRO through 2007.

It should be noted that sewage water is not metered but usually assumed equal in quantity to the measured amount of drinking water consumed.

Year		1996	1998	2001	2003	2004	2005	2006	2007
Drinking	Households	5.00	8.00	11.50	16.07	21.69	28.95	37.44	37.44
water	Others	15.80	21.20	25.30	36.48	36.48	37.44	37.44	37.44
Sewage	Households	3.00	4.00	7.50	10.15	13.19	17.59	22.87	29.25
water	Others	10.80	15.90	18.70	26.22	26.22	29.25	29.25	29.25

Households are determined by the National Office according to the Act 276/2001. Others are regulated by the National Office as the maximum applicable tariff; exceptionally different tariffs might be applied in the case highvolume discount (lower tariff) or high concentration of pollutants (higher tariff). After the 2007, the increase will follow the inflation, plus 5% increase. Thus the production costs in 2007 will be corrected by the inflation factor of

Table 3 Development of Water Tariffs (including VAT) in the PWC (SK)

Source: Internal data of the PWC

2.2.4 Regulatory Relationships – Environmental

Environmental regulation consists of an obligation to receive

- the permit for the withdrawal of ground and surface water, and
- the permit for the discharge of treated water into the recipient water body.

The permits are issued by the Environmental Department of the District Office. The permit for the discharged wastewater was issued for each WWTP in Poprad branch (totally 3 under operation). Also, wastewaters that are not treated must have a permit (2 discharges).

The MU is obliged to pay withdrawal charges for the withdrawal of ground water and surface water. These are 1,80 Sk/m³ for surface water and 1 Sk/m³ for ground water. The charges are income of the River Basin Management Enterprise for surface water and an income of Ministry of Environment (MoE) for ground water. In 2002, the total amount of withdrawal charges was 17.4 mill. SK.

Also, the pollution charge for discharge of wastewater is paid. The pollution charges are collected by River Basin Management Enterprise and are the income of the MoE. In 2002 it was 8.3 mill. SK. The mechanism of the calculation of pollution charge is described in the Slovak National Profile of the Slovak Country Report for the Tariff and Charges Project.

2.4. Interactions and Conflicts between MU, RU and SU

There are several conflicts between the MUs and RUs:

- The tariffs for households and industry are regulated by NRO. MU is obliged to increase the tariff for households by the coefficient established by the National Office.
- National Office has a policy to reduce the gap in the tariff between households and industry (all SUs will have the same tariff). This will increase economic pressure (increased costs) on households and political pressure (to minimize cost increases) on municipalities and the Central Government.
- The PWC pays withdrawal fees for surface and ground water. Although the fees levels are currently also regulated (by the Ministry of Finance) there is a threat that these fees will increase in the near future. In the past, these fees were returned to the PWC in the form of a transfer from the central Government. No subsidies are granted from 2003 as the PWC was transformed from the state own water utility to the municipal water company.
- Currently, the Environmental Department of the District Office is reviewing all permits issued in 1994 for existing discharges and temporary permits for the discharges without treatment. The Environmental authority must issue new permits by the end of the year 2003 and is tied by the new Regulation on Permissible Level of Pollution, and new Water Act. As this legislation is in compliance with EU water directives, limits for discharges will be stricter. The service area also lies in a designated sensitive area and new limits must be reached by 2004. It is expected that the PWC will receive a temporary transition period as a new WWTP is under construction and the new EU-based effluent discharge limits are supposed to be met by 2007.
- The PWC is not excluded from the payment of pollution charges although the WWTP is under the construction during this transition period.

There are conflicts between MU and SU:

• There are groups of inhabitants that do not pay for the drinking water and MU is reluctant to cut off their supply of drinking water. An internal decision of the PWC management was

made that un-paid clients will be disconnected or the responsibility for the payment will be passed on the municipality but how this policy will work in practice is unknown.

- Consumption of households has been decreasing and this has caused reduced revenues and certain technical problems in distribution pipes and treatment efficiency that increase operating costs per m³.
- There is not an expectation that old claims for the past water bills will be collected. However, it is not clear what is the volume (amount) of the old claims, as the process of transformation is not completed. Totally, the PWC has 120 mill. SK of claims.
- The PWC has 25 mill. SK in loans from domestic commercial banks and 150 mill. SK debts to its suppliers. Thus it must pay a total of 175 million SK in debt out of its revenues.

There is also an internal conflict within the MU, where investment needs and financial resources of the PWC are not balanced. In other words, the PWC developed a detailed investment plan without the real plan for obtaining the necessary financial sources or a plan to repay any associated debt.

3 Current Operating Conditions of Management Unit

In this section we begin to develop a more detailed description of accounts, facilities, costs, and revenues for the PPB. Most of these date will be used directly, or become the basis for, data to be used in the ASTEC model.

3.1 Physical Conditions

The main source of water in the Poprad district is spring water. There are two spring fields:

- LT Spring (561 l/s, varying from 500 800 l/s), supplying most of Poprad and Svit towns and some of the villages northeast of Poprad; the chlorination station is in place but not functioning and the chlorine is added at the pressure break on the main transmission line to the town of Poprad.
- NO Spring with 128 l/s capacity, supplying town of Poprad and surroundings. The water is chlorinated.

There are three additional small water springs with a yield of 20 - 25 l/s and equipped with filtration, pH adjustment and disinfection.

The second largest source of drinking water is ground water. There are 8 deep wells (of 80 - 160 m depth) with submersible pumps.

The PWC also withdraws surface water from a small river with capacity of almost 100 l/s. The treatment consists of sedimentation, rapid sand filtration, lime dosing and disinfection. One treatment component consists only of chlorination.

In total there are 8 treatment units, 7 of which 7 have:

- rapid sand filtration with open sand filters
- pH adjustment (lime or dolomite filtration)
- disinfection (NaClO2 or Cl gas)

The distribution systems consist of the main gravity pressured 700 mm steel pipe constructed in 1973 and a number of smaller networks. The system for drinking water production and distribution needs some modernization and/or replacement. This is particular important for pumping stations and treatment plants. Also, there is a high percentage of un-accounted for water that represents in average 33% (but varies from 19 - 65%). In general, facilities are well maintained and satisfactory operating. The program of extension and substantial replacement and repair of drinking water supply is planned in the longer period (beyond 2015). The short-term plan includes the rehabilitation of 16 km of pipes in order to decrease leakage. This investment is estimated to cost of 24 mill. SK. The treatment plant rehabilitation is planned for the period of 2005-2010 and 2015 at a total estimated cost of 212 mill. SK.

The wastewater system is constructed as a combined wastewater and storm-water system (except one minor part of the sewer system in Poprad South III). It consists of 6 major sub-structures.

Under normal conditions, the collection system is satisfactory but in situations with extreme surface runoff, the hydraulic capacity in the sewer is not large enough to handle the accumulated runoff. Overflow constructions were established to avoid backup of water in cellars and roads. This combined sewer overflow allows a part of the wastewater to be discharged from the sewer to creeks or rivers.

There are 3 existing WWTPs and one WWTP (MATEJOVCE) that is not yet completed. These WWTPs are:

Old WWTP in town of Poprad

It has operated since 1969. It has mechanical and biological treatment and anaerobic sludge handling. In 1991, a new technological unit, Cityclar, was connected in parallel. The wastewater from the City of Poprad is treated in this WWTP. The permit to discharge wastewater was issued in 1994. The WWTP consists of following facilities:

- o overflow chamber before the WWTP
- closing chamber and hand-raked bar screen
- centrifugal sand trap
- primary clarifier (1 tank) and activation tank (4 tanks) with 8 aerator turbines. One tank is used as sludge regeneration, 3 tanks are contactor tanks
- pumping station for mechanical pretreated of water, storm water, return sludge, primary and excess sludge
- o secondary clarifier (1 tank), hydraulically overloaded
- o anaerobic sludge handling in two stages with boiler house and gasholder
- o sludge dewatering in centrifuge
- treatment unit Cityclar consisting of pumping station and mechanical pretreatment tank, 2 biological reactors and a sludge storage tank

The WWTP is has old technology and old types of mechanical equipment. It is not suitable for reconstruction or extension to comply with the new Slovak effluent limits. Effluent parameters and effluent limits according to the permit of Environmental District Office from 1994 are as follows (in mg/l):

Table 4Effluent	Parameters	and	Limits
-----------------	------------	-----	--------

	Pollutants						
Parameter (in mg/l)	COD	BOD ₅	SS	N-NH4	Ntot	Ptot	
Effluent	63.7	35.5	26		18	2.6	
Limit	85	40	35	60		5	

Old WWTP in Nova Lesna

This plant began operating in 1985 and will be in use only until completion of the new MATEJOVCE WWTP. It consists of

- hand-raked coarse bar screen and sand trap
- o flow measure channel
- o dividing chamber for two biological treatment lines
- o activation tanks (2 tanks) with aerating turbines and secondary clarifier (2 tanks)
- sludge storage tank (1 tank), the excess of sludge is transported to old WWTP of town Poprad

Table 5	Technical	Parameters	and	Permitted	Limits	Issued	by	the	Environmental
	District Of	ffice in 1994 (in mg	g/l)					

	Pollutants							
Parameter (in mg/l)	COD	BOD ₅	SS	Ntot	Ptot			
Design parameters		191						
Influent	186	99	84	18	4			
Effluent	30.63	17.21	13.42	8.86	1.58			
Limit	55	25	35					

Old WWTP in Smokovce

It is plant with mechanical and biological treatment. It has been in operation since 1971. The WWTP consists of

- o dividing chamber and flow measure channel
- hand-raked coarse bar screen and sand trap
- primary clarifier (2 tanks) and activation tank (4 tanks) with aerating turbine (partly damaged)
- secondary clarifiers (2 tanks)
- return sludge pumping 2 sludge pumps
- sludge storage tank (1 tank)
- chlorination tanks (2 tanks), but chlorine is not added.

New MATEJOVCE WWTP

Construction started in 1991 as mechanical biological treatment and anaerobic sludge digestion. Construction was never completed due to a lack of funding. A project has been planned to upgrade the plant with N and P removal. Currently the project is being considered for receipt of an ISPA grant. The technical design will allow meeting strict environmental limits mandated for of sensitive areas.

Table 6 summarizes the collection and treatment of wastewater in the PPB.

Table 6	Collected and	Wastewater	Discharged,	2002 (thou. m ³	')
---------	----------------------	------------	-------------	--------	----------------------	----

3 802
3 583
782
7 385

Source: vykaz Vod Z 1-01

Table 7 shows quantities of water produced, purchased, unaccounted for in the PPB.

Variable	
Number of inhabitants	139 799
Number of inhabitants connected to public drinking water supply	94 319
Water Production	
Water produced	15 264
Water transferred free of charge to another PWC unit (to Spisska Nova Ves)	3443
Provided drinking water – Invoiced Water	
Households	4 896
Small industry and others	2 370
Large industry	1 185
Unaccounted Water	
Losses (leakage) in pipes	3 370
Own consumption	285
Other unaccounted water	106

Table 7 Amount of Water Produced, Invoiced and Unaccounted, 2002(thous. m³)

Source: vykaz VOD 1-01, 2002,

3.2 Financial Conditions

3.2.1 Prices, Sale and Revenue

Drinking water is provided for households and other clients. The prices are set based upon the Decision of the NRO and in 2003 it is 14.10 SK/m³ for households or accounts classified as like residential accounts (16.07 Sk/m³ with VAT) and 32 SK/m³ (36.48 SK/m³ with VAT) for Other Users. A similar situation applies in the case of collected and treated wastewater. The households or accounts classified as like residential accounts price is 8.90 SK/m³ (10.15 with VAT) and Other Users price is 23 SK/m³ (26.22 Sk/m³ with VAT). The development of prices in the period of 1996 – 2003 and the proposal for 2004-2007 is shown at the Table 3. Income of MU from W&WW services in 2002 was 131.5 mill. SK for drinking water and 86.1 mill. SK for collected sewage water.

Other income to the PWC comes from construction services, installment of connections, and other activities as shown in Table 8.

Table 8 Other Income of the PWC, in Period 2000 – 2002 (thous. SK/year)					
Item	2000	2001	2002		
Revenue from drinking water supply	127 700	134 278	131 551		
Revenue from wastewater collection and treatment	93 262	95 208	86 151		
Total revenue from W&WW services	220 962	229 486	217 702		
Construction works	711	771	159		
Installment of connections	1 298	630	651		
Other production activities	135	711	1 055		
Other non-production activities	1 981	2 372	2 531		
Other revenue	3 272	2 623	4 833		
Total from other than W&WW services	7 397	7 107	9 229		
Internal revenue*	6 050	7 950	7 007		

Source: Internal statistical data of the PWC, 2003

* internal revenue represents the income from transferred water to other utility of the same water company

3.2.2 Expenditures

Expenditures include costs of purchased inputs and cost of investments through amortization and depreciation allowances. It should be noted that current pollution charges paid by the PPB represents less than 5% of total annual expenditures.

Table 0	Costs of W & WW	Somioos	2002	thous SK	h
I able 9		Services,	2002 (mous. Sr	J

Parameter	Costs (thous. SK)
Material consumption	37 340
Energy consumption	18 041
Repair and maintenance	8 514
Salaries	59 228
Overheads (services, ravel and P&R)	6 829
Amortization	38 883
Depreciation allowances	51 010
Other (including pollution charges)	10 743

Source: internal statistical data of the PWC, 2003

For the purpose of the case study, the costs of investments were investigated only for the selected service area of the PPB.

Drinking water

The investment and operating costs of all the operating facilities described above was grouped into:

- Treatment facilities (in the case of the PPB service area, these are simple treatment facilities as the majority of water is withdrawn from springs and wells). The treatment facilities consist of simple sedimentation, filtration, pH adjustment and disinfection.
- Distribution system

Both items have an assumed lifetime of 40 years.

Collection and treatment of wastewater

The investment and operating costs of facilities were grouped into:

- sewer network (40 years lifetime)
- wastewater treatment (30 years lifetime)
- machinery and equipment (12 years lifetime)

All costs are listed for existing facilities. New MATEJOVCE WWTP is a subject of the project preparation that is currently under consideration for an ISPA grant. The total investment cost of the ISPA project was taken from the short list of ISPA strategy (pipeline of ISPA projects).

3.2.3 Grants and Transfers

In 2001, the PWC received an annual transfer from the Government, so called "earmarked subsidy" to recover cost related to tasks in the public interest. These were actually a rebate of costs that the PWC paid for the withdrawal of surface and ground water and part of production costs with respect to treatment and distribution of drinking water. Since 2002, the company has not received any grants and transfers.

3.2.4 Existing Contracts

The PWC provides services to SUs based upon a contract. The are following groups of SUs are distinguished because of cost, service, or tariff differences:

- Households who are connected to the complete W&WW services, including wastewater treatment
- Households who are connected to drinking water supply and sewer system, but wastewater is not treated and is directly discharged into the recipient water body
- Households who are connected to drinking water supply without sewer services and use holding tanks
- Large industry that comprises several chemical and mechanical industries. These industries use W&WW services for both infrastructure (offices, canteens) and production activities
- Small industry and other commercial users, located mainly in Poprad and Svit. Also, commercial users are small pensions, restaurants and tourist industrial companies in towns Smokovce and Strba.

Potential SUs are:

- inhabitants to be newly connected; the sewer system is under construction and will be connected to the new WWTP (approx. 15 000 20 000 pe)
- there is a plan to establish an industrial park that might use W&WW services.

4 Regulatory Unit and the PWC

4.1 National Planning and Permitting

Basic national requirements are discussed in detail in the Slovak National Profile Report. In general, there is only framework planning document that includes all communities that require construction and/or upgrade of a W&WW system. This national plan is limited to the statement that the PWC is located in the sensitive area and must meet strict emission limits. The current ISPA project support plans include an investment in the WWTP Matejovce.

In summary, the PWC must have following permits:

- license to operate the W&WW system; the license is issued by the License Office.
- Operation Order that includes all technical details, manuals, work safety guidelines, accident and emergency plan; the Operation Order is approved by the Environmental District Office.

4.2 Economic Regulation

The PWC must receive the Decision of the National Office for Regulation of Network Sectors on maximum allowable price for households and industry. The details of such a ruling the design of the maximum tariffs are described in the Slovak National Profile of this report. The PWC is the VAT-tax payer.

4.3 Environmental Regulation

The PWC must receive:

- permit to withdraw ground and/or surface water
- permit to discharge waters and wastewaters.

The permits are issued by the environmental authority (Environmental District Office). Permits include a monitoring obligation with set measuring frequencies and reports. Parameters of quantity and quality of discharged wastewater are specified in the permit. The Environmental District Office also issues the payment decision on withdrawal water charges and pollution charges. These payments are enforced by River Basin Enterprise (under the Slovak Water Management Enterprise that is a governmental agency). Besides water and wastewater permits, the Environmental District Office must approve the Waste Management Plan. The plan includes conditions for handling of sludge and its final disposal. It also includes the conditions for handling other waste generated by the PWC. Further details on the environmental requirements are described in the Slovak National Profile of this project.

5 The PWC Planned Operating Conditions

5.1 Physical Conditions

The service area is rich in water sources suitable for drinking water supply; the problem is with the discharge of wastewater. The PWC has a plan to phase out three existing, obsolete WWTPs and reconnect all municipal wastewaters into a single WWTP that will be equipped with nutrient removal technology. The investment project is currently under the development and the PWC has applied for an ISPA grant. The completion of the new WWTP will also support new residential and commercial connections in the service area (including customers who currently use holding tanks).

In the medium-term, there is not a plan to invest in a drinking water network. The program of extension and substantial replacement and repair of the drinking water supply is planned in the longer term (beyond 2015).

The PWC does not have a clear picture about the future development of W&WW services. The management is skeptical about the growth in water consumption. All drinking water service users have an incentive to reduce the water consumption given projected tariff increases. The installment of water meters and water saving equipment in households will lead to more effective water use. The industrial users will seek to reduce water costs in order to reduce production costs as the water bills of some industrial units can be an important share of the total production costs. Another alternative for large industrial clients is to find or expand privately developed and owned sources of water

5.2 Financial Conditions

The PWC has already developed a plan for the increase in tariffs. It is not clear, if the PWC included new investment in the forecast of the tariffs. In any case, the tariffs are subject to the approval from the NRO. Table 10 shows that the tariffs for household consumers will increase faster and, by 2007, equal the tariffs of Other User customers.

Year		2003	2004	2005	2006	2007
Drinking	Households	16.07	21.69	28.95	37.44	37.44
water	Others	36.48	36.48	37.44	37.44	37.44
Sewage	Households	10.15	13.19	17.59	22.87	29.25
water	Others	26.22	26.22	29.25	29.25	29.25

 Table 10
 Development of Water Tariffs (including VAT) in the PWC (SK)

Source: Internal data of the PWC

6 Scenario Development

The ASTEC model is designed to run numerous, hypothetical tariff, investment, effluent charge and policy combinations. It was tested for the Poprad case study with many variations in key input data². The main variables are:

- entities` accounts
 - Current SUs represent number of pe. In the case of industries, the number of entities` accounts (pe) was estimated by the PPB.
 - New SUs represent number of households that will be connected to the sewage system after completion of new sewers and the new WWTP
- investment costs
 - in each model trial, past investment costs are zero, as the operator inherited the system without any financial obligations
 - o fixed annualized costs that deal with regular repair and maintenance of the system
 - fixed annualized costs that deal with the adjusting entry (allowance) represent future savings associated with cost-saving investments.
 - fixed annualized costs that deal with annual salaries and management overheads (expressed as services, P&R, remuneration)
- depreciation of facilities and amortization of debt
 - o amortized payments on short-term commercial debts the operator is obliged to pay
 - replacement investment costs deal with the investment necessary to replace the system (no upgrade, no increase efficiency)
 - new planned investment deal with the planned project to build a new WWTP and associated collection networks that will serve all existing SUs as well as new WW service users. The project also deals with the treatment of wastewaters that are currently collected by public sewer system but discharge directly into the recipient water body
- operation costs
 - Current operation costs deal with the production of drinking water and collection and treatment of wastewater. Major components of operation costs are materials and energy.
 - New user charge deals with the establishment of a new charge for the withdrawal of ground and surface water for drinking water purposes. This charge exists in Slovakia at the level of 2 Sk/m3 since 1989, but public W&WW operators were excluded from this charge. New Regulation on Water Charges envisages establishing this charge for all water users.
 - New pollution charge deals with the establishment of new effluent charges that will replace existing effluent charges. New Regulation of Water Charges envisages that pollution charges will be based on the quality parameters of discharged water, with the emphasis on removal of N and P. Currently applied pollution charges (from 1979) favor those polluters that discharge a high volume of wastewater regardless of the treatment technologies.
- tariffs
 - tariffs for households are established by the NOR. There is an annually increase of tariffs by the coefficient 1.35 for drinking water and 1.30 for sewage water. The operator has already estimates on tariffs by 2007.
 - Tariffs for others are also established by the NRO based upon the redistribution of total production costs of the individual operator.

² A guide to the ASTEC model can be found in Vol 1 of the Tariff and Charges Project report.

The ASTEC model for PWC and the Poprad Brand was constructed to allow for the modeling different scenarios depending on the issue of interest. The selected variable parameters included:

- Increase of tariffs for selected groups of clients. This is the most interesting variable parameter. The managers need to know what will be the balance of revenues and costs in on-going years, as it is decided by the NRO that tariffs can increase to reach full cost recovery.
- Increase of pollution charges and user charges. This is very important feature in the case of Slovakia. Currently, pollution charges are obsolete, designed from 1979 without any incentive function. The details on pollution charges are discussed in the Slovak National Profile of this study. It has been assumed that if pollution charges (and user charges) increase by 10-fold that this might result in different behavior by the operator of W&WW systems as they try to control the costs.
- Increase of investments. The Podtatranska Water Company has developed an investment project to meet a new Slovak Water Act that requires removal of nutrients for all agglomerations larger than 10000 pe. Also, the operator has prepared an attractive investment project to receive ISPA grant covering up to 75% of total investments. The additional financial sources for the investment and associated operating costs must be sought from system revenues or at a lender. These features were modeled in this case study.

Besides variable parameters listed above, ASTEC includes some automatic options that allow for different strategies for setting tariffs that cover costs:

- Scenario Type 1: full cost recovery (FCR) without marginal cost pricing (MCP). During the model run the tariff changes so as to reach full cost recovery by selected users at the minimum tariffs necessary to provide revenues that just cover costs. This is economically not necessarily an economically efficient scenario if tariffs do not equal the short run marginal costs (when there is excess capacity) or long run marginal costs when demand would otherwise exceed capacity. Nevertheless, such cost-recovery strategies are widely used in practices.
- Scenario Type 4: no marginal cost pricing and no cost recovery The original tariffs and charges are maintained. Used to explore the budgetary implications of investments or policies initiatives without raising tariffs or adjusting effluent charges.
- Scenario Type 5: no marginal cost pricing, no full cost recovery, new tariffs and charges are used. No optimization is carried out, but the new level of tariffs will influence service level through the elasticity of demand.

Other automated scenario types of ASTEC (2 and 3) were not used in the Slovak case study of the PWC and the Poprad Branch.

As it is described above, the model allows for numerous alternatives. The limited selection of scenarios was tested and the results of modeling are summarized as follow.

6.1 Baseline Scenarios

Description of the CURRENT PPB SYSTEM in 2002

This is the most straightforward scenario. The description of the current PPB system in 2002 was input into the ASTEC model. Model inputs:

- Current SUs only
- <u>Tariffs of 2002</u> applied that are based on the Decision of NRO
 - Tariffs for Households are 10.45 SK/m³ of drinking water and 6.80 SK/m³ of sewage water
 - Tariffs for Others are 23 Sk/m³ of drinking water and 17 Sk/m³ of sewage water
- Investments costs include fixed annualized costs (maintenance of current system), depreciation, salaries, management overheads, and the debts to be paid
- Operation costs include current operation costs and current effluent charges (based on volume of discharged wastewater). It should be noted, that current effluent charges are based on the volume of discharged wastewater rather than quality of discharged wastewater.

Question:

What is the balance of revenues and costs of the operator when fixed tariffs of 2002 are applied? What tariffs should be applied to reach full cost recovery (without marginal cost pricing)?

S0: Scenario type 4: no marginal cost pricing, no full cost recovery and original tariffs and charges are applied

S1: Scenario type 1: FCR, not MCP

Results and Analysis:

The operator runs the PPD system with a net revenue + 50 mill. SK annually. In the case of the FCR, tariffs would be significantly lower for both customer groups (HH and IND) in the drinking water supply. However, the tariffs for wastewater services should increase for HH to reach the tariffs of IND. This last result occurs in part because we assume that the costs associated with providing wastewater service to HH is the same per m^3 of service as it is for industrial customers.

These results suggests that

- the operator cross-subsidies costs of wastewater treatment by higher tariffs for drinking water supply
- IND wastewater customers cross-subsidizes HH wastewater customers. Remember, however, that this result assumed IND customers effluent was no more costly to treat that HH

Description of CURRENT SYSTEM in 2003

There was a decision by the NRO that the tariffs must gradually increase by given coefficients. This situation was tested in the Poprad application of ASTEC.

Question:

What is the balance of revenues and costs in 2003 when the NRO decided that households` tariffs should be increased by the coefficient 1.35 for drinking water and 1.30 for sewage water?

Model input:

Same as previous scenario, except the tariffs of 2003 of National Office decision are applied.

S2: Scenario type 4: no marginal cost pricing, no full cost recovery and the new tariffs and charges are introduced.

Analysis:

Operator in 2003 runs the system in higher net revenue in comparison with 2002 due to increased tariffs for both groups. The net revenue represents +128.7 mill. SK.

Description of the system with NEW POLLUTION CHARGES and NEW USER CHARGE in 2015

Currently, the pollution charge is based on volume of water discharged. From 2015, the pollution charge will include quality components, among which N_{total} and P_{total} will have a significant impact on the operation of WWTP.

Question:

What would happen to the current system if the new user charge and new effluent charges scheduled for 2015 are applied today?

Remark: The scenario models the situation in 2015. For this purposes, the investment costs that represent 'replacement of facilities by 2015 were inserted. In other words, the operator will operate the system without an upgrade of the current WW treatment technology.

Model inputs:

- current SUs only
- 2003 tariffs applied
- investment costs include replacement investment costs for water and wastewater treatment facilities in 2015 and fixed annualized costs (taken from S0 and S1)
- operation costs:
 - \circ new user charge 2 SK/m³ of withdraw water,
 - new pollution parameters BOD = 12 Sk/kg, COD = 1.40 SK/kg, SS = 2.4 SK/kg, Ntot = 14 Sk/kg and Ptot = 90 Sk/kg

S3: Scenario type 4: no marginal cost pricing, no full cost recovery and 2003 tariffs and charges are applied

S4: Scenario type 1: FCR, no MCP applied

Analysis:

With the increase of pollution charge (from 8.3 mill. SK to 60.7 mill SK), the operator runs the system in a net revenue - 20 mill. SK (when 2003 tariffs are applied).

The results of analysis are that

 new user charge for drinking water supply will significantly impact the operator's costs (operation cost represents almost 50% of total cost of drinking water service) the new pollution charge does have a dramatic impact on the increase of total costs for wastewater service. Pollution charge contributed to the total costs for wastewater services by 7 %; after the increase, it represents 30%.

6.2 Expansion/Upgrade Scenarios

The New Water Act mandates the upgrade and expansion of the current wastewater system of the PWC. The upgrade and extension will include a new WWTP that will allow for removal of nutrients and connecting new households to the system. It will also solve the problem of untreated wastewater of the community that is currently connected to the sewage system, but the wastewater is directly discharged into the recipient river body without the treatment. The details are discussed in the chapter 5.1.

Description of the system with PLANNED INVESTMENT in 2015

Question:

The operator will build a new WWTP that will allow connecting households that are currently not treated; new clients (only households) will be also added. What will happen with the current system when these new investments are completed? In addition, the new user charge and pollution charges will also be applied.

Remark: new operation cost for WWTP takes into account the treatment of excess of sludge due to nutrient removal. Also, higher consumption of chemicals and energy is reflected in the costs. The drinking water services are not upgraded; only replacement costs for the system scheduled through 2015 are applied.

Model input

- additional SUs
- 2003 tariffs applied
- investment costs:
 - o planned investments to build a new WWTP and extend sewage collection network
 - o fixed annualized costs
- new operation costs (based upon the assessment of operator) and new operation costs to remove excessive sludge added
- old operating cost reductions associated with abandoned WWTP

S5: scenario type 4: no marginal cost pricing, no full cost recovery and original tariffs and charges are applied

S6: scenario type 1: full cost recovery, no marginal cost pricing, everyone pays the same charge using the ASTEC clustering method of cost allocation.

Analysis:

The construction of new WWTP will bring additional costs and the operator will run the system in net revenue -26.5 mill. SK. Based upon the analysis it is shown that:

 pollution charges will be lower (from 60.7 to 48.3 mill SK) but the total costs to treat wastewater will increase from 200 mill SK to 222.2 mill. SK

- pollution load into the recipient will increase due to larger volume of wastewater collected from new clients
- there will be a dramatic impact on HH tariffs but the IND will be better off (have lower wastewater tariffs) than at present.

The same input data were used modeling the S5 and S6 scenarios with the exception that the investment costs were replaced by the ISPA grant at the level of 50% of total investments into a new WWTP. The results are summarized at the Table 9. It is obvious, that the ISPA grant will bring the operator in positive net revenue (+37,1 mill. SK annually). In the case of FCR, the wastewater tariffs will increase moderately for the households (from 10.70 to 11.4 SK/m³) and decrease relative to scenario S6 for IND clients (from 27 to 18.50m SK/m³).

6.3 Modeling of Total Service Area

The PPB unit is a fragment of the total service area that was selected for the modeling due to the developed financial plan to upgrade the WWTP to tackle water pollution in sensitive area. The Podtatranska Water Company (PWC) is composed of two additional units: Spiska Nova Ves and Stara Lubovna. Thus, the overall W&WW service development, investment planning including the tariff policy of the management is established for the total service area. The operator claims that the production costs are high despite a regular increase of tariffs. The Purpose of the modeling was to assess the revenue/cost balance for the total area.

Model inputs:

SUs of total area served are divided into following 8 groups

- drinking water and sewage services to households (PP, SNV and SL)
- only drinking water to households (PP, SNV and SL)
- large industry
- small industry

All other parameters are taken as S0 for the all area of three units.

S7: scenario type 4: no FCR, no MCP (No new investments are tested, no new user charge, no new pollution charges are tested).

S8: scenario type 1: FCR, no MCP

S9: scenario type 4: no FCR, no MCP (No new investment, but new user charge and new pollution charge tested).

Analysis

Operator runs in a net revenue -35 mill. SK annually. The situation will be worse when new pollution charges will be applied, the net revenue will be -160.1 mill. SK annually. Even, a planned increase in tariffs (set by the NRO) the net revenue will be -22.1 mill. SK. In the case of FCR, the tariffs should increase for HH but decrease for IND. It was not possible to model the situation when the PWC invests into the upgrade/expansion of its facilities outside the PPB due to absence of relevant data (for two additional units).

Summary description of each scenario	Tariffs of drinking	water Sk/m ³	Tariffs for wastewa	ater Sk/m ³	Revenue mill SK		Costs mill. SK		Balance	
	households	others	households	others	Commodity	Fixed	Annualized	Operation	Pollution	
					charge	tariffs	inv. costs	costs	charge	
S0: (type 4)	10.45	23	6.80	17	217.0	0	134.6	25.1	83	+40.0
Current status in 2002	10.45	23	0.80	1 /	217.9	0	154.0	23.1	0.5	149.9
S1: (type 1)	4.61	1.63	17.08	17.08	166.2	0	134.6	22.0	83	0.5
Current status in 2002, FCR of S0	4.01	4.05	17.00	17.08	100.2	0	154.0	22.9	0.5	- 0.5
S2: (type 4)	14.10	32	8 00	23	206		134.6	25.1	83	± 128.7
Status with 2003 tariffs,	14.10	32	8.90	23	290		154.0	23.1	0.5	120.7
S3: (type 4)										
Replacement of facilities in 2015	14.10	32	8 00	23	206.7	0	108.4	55.6	60.7	20.0
Tariffs of 2003 applied	14.10	52	0.90	23	290.7	0	190.4	55.0	00.7	- 20.0
New PCH and UCH applied										
S4: (type 1)	11.50	11.50	20.74	20.74	302	0	108.4	477	56.0	1.0
Same as S2, but FCR required	11.50	11.50	27.74	27.74	502	0	170.4	47.7	50.7	- 1.0
S5: (type 4)										
New investment of WWTP, incl. new clients	14.10	32	8 00	23	310.6	0	228-1	60.6	18.3	26.5
New PCH, UCH	14.10	52	0.70	23	510.0	0	220.1	00.0	40.5	-20.5
Tariffs of 2003										
S6: (type 1)	11.70	11.70	27	27	324	0	228.1	52	15.5	- 1 7
same as S4, but FCR required	11.70	11.70	27	27	524	0	220.1	52	45.5	- 1.7
S5ISPA (type 4)										
New investment of WWTP, incl. New clients	14.10	32	8 00	23	310.6 +	0	228-1	60.6	18.3	+ 37.1
New PCH, UCH	14.10	52	0.90	23	30.4*	0	220.1	00.0	40.5	- 57.1
Tariffs of 2003										
S6ISPA (type 1)	11.40	11.40	18.5	18.5	265 +	0	180.1	53.8	18.3	- 1.8
Same as S5ISPA, but FCR required	11.40	11.40	10.5	10.5	30.4*	0	100.1	55.8	40.5	- 1.0
S7: (type 4)										
Total area	10.45	23	6.80	17	354		231.7	113.6	43.6	- 34.9
current system, tariffs of 2002										
S8: (type 1)	774	7 74	22.22	22.22	270.2		221.7	108.0	41.2	27
Same as S7, but FCR required	/./4	7.74	23.32	23.32	579.5		251.7	108.9	41.2	- 2.7
S9: (type 4), Same as S7 plus										
New PCH and UCH applied,	14.10	32	8.90	23	492		231.7	155.3	127.1	- 22.1
tariffs of 2003 applied										

 Table 11
 Summary of Scenario Results from the ASTEC Model with PPB and PWC Data

* annualized transfer of ISPA

7 Scenario Results

The Poprad unit of the larger Podtatranska Water Company has a plan to complete an investment in a new WWTP and to extend collection network for wastewater. The investment projects will provide a solution to several problems:

- to meet the strict EU requirements with respect to new pollution limits designated for sensitive area
- to connect current community to WWTP that has sewage collection system in place, but wastewaters are not treated
- to add new households to W&WW services
- to close existing obsolete WWTPs in the area that will bring operational savings
- to allow the expansion of tourist industry in the area in the High Tatras.

The PPB unit does not have any problems with drinking water supply in the short term; it has access to good quality of drinking water sources from local wells and springs. There is a problem with leakage that reaches 22.9% in the Poprad unit, but the average leakage for the total area (including the two additional units) is 33%. This higher leakage contributes to higher operation costs: in Poprad operating costs are 3.95 SK/m³ while operation costs in the total area are 14.8 SK/m³.

The PPB unit received the Decision of the NRO with respect to tariffs for households and industrial clients. Based on the spreadsheet model, we showed that the PPB unit apparently runs the W&WW service with substantial positive net revenue. However, the tariffs are calculated based upon the production costs of the total area (include two additional units). As it is shown in the spreadsheet model, the total area services currently appear to run at a loss after allowing for all costs, including depreciation.

Results of the modeling shows that to attain cost recovery the tariffs for households should slightly increase, but the industry would be better off and tariffs would be almost a half of the current tariffs.

In spite of untreated wastewater of 30% of population, the pollution charges are small and do not provide any incentive to built a new WWTP. A driving force to invest into a new WWTP is the strict limit for the discharge recently adopted by the Government. The PPB unit is eligible to receive ISPA grant, as the service area fits into a sensitive area and nutrient removal is an obligation. In a near future, the Poprad unit area will need to carefully plan investments to upgrade drinking water supply system as well.

In general, the cost-increasing factors include:

- the need to replace an ageing infrastructure
- the costs of meeting increasing demands for water
- the historic under-pricing of water services (use of average historic costs)
- failure to create adequate replacement funds
- deferral of capital improvements; and
- reductions in past subsidization by the Central Government.

In order to improve cost effectiveness and reduce the burden on customers, the oversight and economic regulation of water operating systems needs to be better integrated and modified.

There appears to be a need for more careful and continuing examination of costs and of tariffs on a system-by-system basis for the purpose of assuring that costs are under control and tariffs impose a reasonable burden on customers and, on the other hand, that tariffs are sufficient to meet the needs for service provision and environmental protection.

How to regulate MUs revenues and encourage cost control?

- role of the NRO should be limited to the regulatory function over the monopoly position of the PWC
- the National Office should not dictate the maximum tariffs uniform for the total serving area and should allow for increasing/decreasing tariffs within the MUs

Burden indices

In the course of the development of this case study, some attention was given to "burden indices". Although the following assessment is devoted to the broad consideration on burden indices, issues of the balancing efficiency and equity and benefits and costs should be studied in details. Burden indices are shown in order to provide more perspective on the cost estimates and tariff changes associated with two selected situations compared with the current status.

In Table 12, current status in Poprad unit is illustrated together with the situation when:

- the operator does not build new WWTP and new environmental charges are applied (A scenario)
- operator built new WWTP to reduce nutrient pollution into the recipient, new environmental charges are applied (B scenario)

The data was extracted from the regional statistic review and could be found at www.statistics.sk/reg

Possible burden indices for scenarios	Baseline	A scenario	B scenario
Absolute annual costs (mill. SK of 2003)	168	315	337
Annual cost per capita served (SK/capita)	1 800	3 350	3 590
Annual costs per capita served as a percentage of GDP per capita (%)	0.013	0.024	0.026
Annual cost per Household/Median net household income (%)	0.008	0.015	0.016
Annual cost per Household/Median income of the lowest quintile (%)	0.13	0.24	0.26

 Table 12
 Burden Indices, Selected Items

Source: for the GDP and the household income, the source is <u>www.statistics.sk</u> - regional indicators

Based upon the illustration, the aspects of affordability of household water services were examined. At the selected case of Poprad community, the annual cost is compared with household income. The impact of increased total costs is not significant for average household income. The situation is more difficult for poor group of inhabitants (those living on social security income). There will be a 50%-increase of total cost of water services in both situations: when the operator will (for scenarios A) or will not (for scenario B) invest into upgraded water services.

In general, Slovak households' spending is not significant for water services in comparison with other expenditures as shown at the following Table 13

Median household expenditure of Medium household expenditure of Parameter average income groups the lowest income groups Total expenditures 100 100 Taxes and insurances levies 20 16 Foodstuff consumption 24 29 Electricity, gas and other fuel 13 11 Housing rent 1.5 2 Water services 0.008 0.009 Solid waste disposal 0.005 0.005 0.01 0.01 Health care services Transport services and personal cars 0.02 0.02 Recreation and leisure services 0.07 0.06

Table 13Share of Expenditure in 2002 (%)

Source: Income, expenditure and consumption in households, Statistical Office, 2002

The distribution of expenditures indicates that social pressure is on taxes and basic foodstuff supply, rather than on water service. However, the prospective doubling of water service expenditures, even for average income households, may push the costs of environmental services generally above the 5% threshold that many suggest is reasonable..

8 Conclusion and Summary

This case study described the recent history, current conditions and planned development of the one selected unit – Poprad Branch. The service area lies in sensitive area and new environmental regulations require upgrading current W&WW system. The purpose of the examination of the investment plan in the PPB unit was to provide a more concrete background and specific insight for use in identifying and evaluating selected institutional and policy reforms connected to water and wastewater tariffs and pollution charges. The case study should be considered in the framework of the National Profile Report. Following table summarizes potential strategy that is considered and/or suggested by the project team.

Strategy Name	Strategy description	Comments/Concerns
Introduction of regulation over monopolies	Examination of individual constituents of costs and tariffs Clear description of cost items including depreciation and future savings Independent auditing Allow for increasing/decreasing block tariffs Informing the public about future rising costs	Time consuming legislative process Needs to improve enforcement
Introduction of cost center	Examination of individual constituents of costs and tariffs Examination of two-part tariff structure Clear description of cost items including depreciation and future savings	Increase costs in a short-term Unwillingness of operator to introduce a cost center Unwillingness of municipal boards to be involved in examination High willingness of industry to participate
Revision of pollution charges	Examination of unit cost of pollution reduction Allow for payment holidays in case of mitigation investments Allow for increasing/decreasing tariff depending on input pollution load (mainly valid for industry)	Needs to improve enforcement and monitoring of polluters



September 2004

ASSESSMENT AND DEVELOPMENT OF MUNICIPAL WATER AND WASTEWATER TARIFFS AND EFFLUENT CHARGES IN THE DANUBE RIVER BASIN.

Volume 2: Country-Specific Issues and Proposed Tariff and Charge Reforms: Slovak Republic – Summary



WORKING FOR THE DANUBE AND ITS PEOPLE



AUTHORS

Danka Thalmeinerová



PREFACE

The Danube Regional Project (DRP) consists of several components and numerous activities, one of which was "Assessment and Development of Municipal Water and Wastewater Tariffs and Effluent Charges in the Danube River Basin" (A grouping of activities 1.6 and 1.7 of Project Component 1). This work often took the shorthand name "Tariffs and Effluent Charges Project" and Phase I of this work was undertaken by a team of country, regional, and international consultants. Phase I of the UNDP/GEF DRP ended in mid-2004 and many of the results of Phase I the Tariffs and Effluent Charges Project are reported in two volumes.

Volume 1 is entitled *An Overview of Tariff and Effluent Charge Reform Issues and Proposals*. Volume 1 builds on all other project outputs. It reviews the methodology and tools developed and applied by the Project team; introduces some of the economic theory and international experience germane to design and performance of tariffs and charges; describes general conditions, tariff regimes, and effluent charges currently applicable to municipal water and wastewater systems in the region; and describes and develops in a structured way a initial series of tariff, effluent charge and related institutional reform proposals.

Volume 2 is entitled *Country-Specific Issues and Proposed Tariff and Charge Reforms*. It consists of country reports for each of the seven countries examined most extensively by our project. Each country report, in turn, consists of three documents: a case study, a national profile, and a brief introduction and summary document. The principle author(s) of the seven country reports were the country consultants of the Project Team.

The authors of the Volume 2 components prepared these documents in 2003 and early 2004. The documents are as up to date as the authors could make them, usually including some discussion of anticipated changes or legislation under development. Still, the reader should be advised that an extended review process may have meant that new data are now available and some of the institutional detail pertaining to a specific country or case study community may now be out of date.

All documents in electronic version – Volume 1 and Volume 2 - may be read or printed from the DRP web site (<u>www.undp-drp.org</u>), from the page <u>Activities /</u> <u>Policies / Tariffs and Charges / Final Reports Phase 1</u>.



We want to thank the authors of these country-specific documents for their professional care and personal devotion to the Tariffs and Effluent Charges Project. It has been a pleasure to work with, and learn from, them throughout the course of the Project.

One purpose of the Tariffs and Effluent Charges Project was to promote a structured discussion that would encourage further consideration, testing, and adoption of various tariff and effluent charge reform proposals. As leaders and coordinators of the Project, the interested reader is welcome to contact either of us with questions or suggestions regarding the discussion and proposals included in either volume of the Project reports. We will forward questions or issues better addressed by the authors of these country-specific documents directly to them.

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Executive Summary

The Country Report developed within the UNDP/GEF project include a "National Profile" that provides descriptions and analyses of water tariffs and effluent charges associated with municipal water systems in Slovakia. An integral part of the Country Report is a "Case Study" that simulates different development scenarios at the water utility level.

The analysis is based on the data provided by the official institutions at national level, such as the Ministry of Environment, Ministry of Agriculture, and the National Office for Regulation of Network Sectors. Also, data of a selected water company were used to investigate the cost and revenue consequences for selected development scenarios. The objective was to select the water utility that represents a common situation in Slovakia and, at the mean time, the water company is planning to invest into its operation in order to meet the EU requirements. An additional aspect was that the newly established water company was willing to cooperate and provide data for the study.

The National Profile includes a discussion of the legal and institutional setting affecting municipal water and wastewater operators. This includes identification and discussion of regulatory units (such as ministries, water authorities, environmental authorities.), management units (ownership and operation regimes), and service users (the different classes of customers). There is also discussion on various dimensions of municipal water operations: service provided, water production, and water quality; regulatory conditions including permitting, approvals, and performance limits; financial and economic data including tariff setting; and physical infrastructure technology, age, and operating condition.

The Case Study provides background information on the management unit and from this background develops "baseline" information such as current production and service levels, customer usage by different groups of customers, water discharge quantities and quality, water and wastewater tariffs, production and treatment costs, and revenues from the sale of the different water and wastewater services.

The Case study is combined with the Accounts Simulation for Tariffs and Effluent Charges (ASTEC) model. ASTEC is a spreadsheet model developed by the core team of the Project and provides for an assessment tool to design and evaluate strategies for tariffs and charges reform.

In Slovakia, W&WW services were in the past typically provided by the state-own W&WW utilities. A decentralization process was officially launched in 1996. However, by 2003, only a few W&WW utilities were transformed into municipal water companies. This long-lasting process brought several tensions in the decentralization process. Besides legal and institutional uncertainty, the water sector is characterized by heavy investment demands, obsolete water treatment facilities, and a lag in infrastructure development. In addition, in the past the water sector in Slovakia was based on heavy state subsidies due to the centralized administration of water prices for households. The underlying problem causing unsustainable water use practices in the water sector. Water tariffs were not determined on the basis of cost-recovery, but rather tariffs were dictated solely by the Government decision and were the same for each household consumer regardless of the production costs of operators, geographical conditions of water provision, and management practices of water operators.

2003 is crucial in the evolution of the Slovak water supply and wastewater sector due to the following factors:

- new water-related legislation was passed (Water Act, Act on Water Supply and Sewerage Utilities, Regulation on Permissible Level of Pollution),
- municipal water companies are being established taking the responsibility of the infrastructure development, cost, and revenues and these municipal water companies are allowed to establish public-private partnerships
- regulation of water tariffs from national level was cancelled and replaced by the regulation of the National Office for Regulation of Network Sectors, and

 state budget contributions to cover the production costs of water and wastewater (W&WW) service operators practically stopped.

The main background considerations reflected in our examination of possible tariff and effluent charge reforms may be summarized as follows:

- The Slovak Government committed to meet the EU UWWT Directive by 2015. The requirement to connect all agglomeration larger than 2 000 population equivalent (pe) into the sewage network and removal of nutrients of agglomeration larger than 10 000 pe will lead to huge investments needs.
- Current effluent charges do not pose any incentive for the operators to install the abatement technologies. There is a plan to revise effluent charges (rates and structure) by 2004 and this will bring an economic burden on water operators.
- The Slovak Government directly (via the National Regulatory Office) regulates the tariffs for both households and industries. The current water tariffs are regulated based upon the justifiable economic costs of service provisions.
- Municipal water companies are being established, although they might delegate maintenance and operation to a municipal or private company. Fundamental problems with this strategy are that municipalities do not have a tradition to create partnerships with the private sector, lack experience to manage the water industry and, rely on the local operators decisions with respect to prioritization of future investments.
- In 2003, the population connected to drinking water supply system reached 83,6%. Drinking water is consumed by households and other users (industry) in a ratio of 66:34.
- Development of public sewer systems is not as advanced as the water supply network. In 2003, 54.3% of the population was connected to sewerage and this has not increased significantly over the last several years.
- Approximately 80-90% of the households' consumed water is metered. The specific household consumption varies within different regions in Slovakia. For example, in Bratislava it is 182 l/p/day, while in other regions it is less than 80 l/p/day. The average specific households water consumption was 123 l/p/day in 2001. There is not a significant increase of water-saving devises.
- The expenditures of households spent on water services is perceived as modest in comparison with other households' expenditures (such as electricity, basic food, health care). This results in low public awareness with respect to public control over water and wastewater tariffs.

Main results of the analysis and simulation costs and tariffs in the case study could be summarized as follows:

- Decentralization (and privatization) allows for provision and responsibility of water services at local (municipal) level. This is a good signal that the Government will have a "regulatory" rather than "provider" function. It is necessary to establish clear responsibilities and institutional arrangements supporting Municipal Boards to oversee the water system and a water operator to manage it.
- The current basic rule of the tariff structure is that the tariffs are designed to cover the operating costs and investment costs (through a depreciation allowance) of the W&WW operator but work needs to be done to assure that these costs are entered properly and apply continuously
- Currently, there are lower tariffs for households' clients and higher tariffs for industrial clients. It
 is necessary to establish a clear mechanism to examine individual constituents of production costs
 including depreciation and future savings. This should be enforced through independent auditing
 of water operators.
- Pollution load of users (those using public water services) is not specifically addressed in the final calculation of the tariffs however could be considered. There are only few examples, that W&WW operator designed tariffs for others (industry) based upon the pollution entering the public WWTP.

Therefore, there should be consideration to allow for increasing/decreasing tariff depending on input pollution load (mainly valid for industry).

- Service users are not aware of current costs and future investments that must be repaid. Therefore
 it is necessary to inform the consumers about future rising costs including better public access to
 information on pollution of recipients.
- The operator does not have substantial incentive to reduce internal operation costs due to several reasons:
 - Households tariffs are indexed and calculated based upon the previous year basis regardless of production costs and the rest of production cost must be recovered from others,
 - Tariffs (both for drinking water and sewage water) are calculated in a way that a final tariff includes 10 15% net revenue for the water company,
 - Improved effectiveness (and thus reduction of operation costs) would lead to a decrease of the accounting profit.

Therefore it is necessary to remove indexing of household tariffs and examine ways to provide better incentives for good management.

 The prospect of major investment requirements and the need to raise tariffs to support them suggests the further consideration of tariff design including examination of the two-part tariffs and increasing/decreasing block tariffs.

The National Profile and Case Studies further outline the proposals for tariff and charges reform using measures that are discussed from with respect to their effectiveness, proportionality and practicality. The description of proposals for reform served as an input for the Volume I of the Tariff and Charges report: *Volume 1: Executive Summary and Overview of Tariff and Charge Reform Issues and Proposals*.